REPORT

DURHAM YORK ENERGY CENTRE

COURTICE, ONTARIO

2019 Q1 AMBIENT AIR QUALITY MONITORING REPORT

RWDI # 1803743

May 14, 2019

SUBMITTED TO:

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1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by The Regional Municipality of Durham (Region of Durham) to conduct discrete and continuous air quality ambient monitoring at the Durham York Energy Centre (DYEC) monitoring stations. The facility address is 1835 Energy Drive, Clarington, Ontario. The DYEC is a facility that manages diverted municipal solid waste from the Regions of Durham and York to create energy from waste combustion. Commercial operation of the DYEC commenced on February 1, 2016. The site location is shown below in **Figure 1**.

Condition 11 of the Environmental Assessment Notice of Approval and Condition 7(4) of the Environmental Compliance Approval (ECA) requires ambient air monitoring to be undertaken by the DYEC. An Ambient Air Monitoring and Reporting Plan was prepared and approved by the Ministry of Environment, Conservation and Parks (MECP) to satisfy these conditions. Three (3) monitoring stations were established to monitor ambient air quality around the DYEC, and quantify the background ambient air quality levels and DYEC contributed emissions to ambient air quality levels.

This monitoring plan was developed based on the Regional Council mandate to provide ambient monitoring in the area of the DYEC. The purposes of the ambient monitoring program are to:

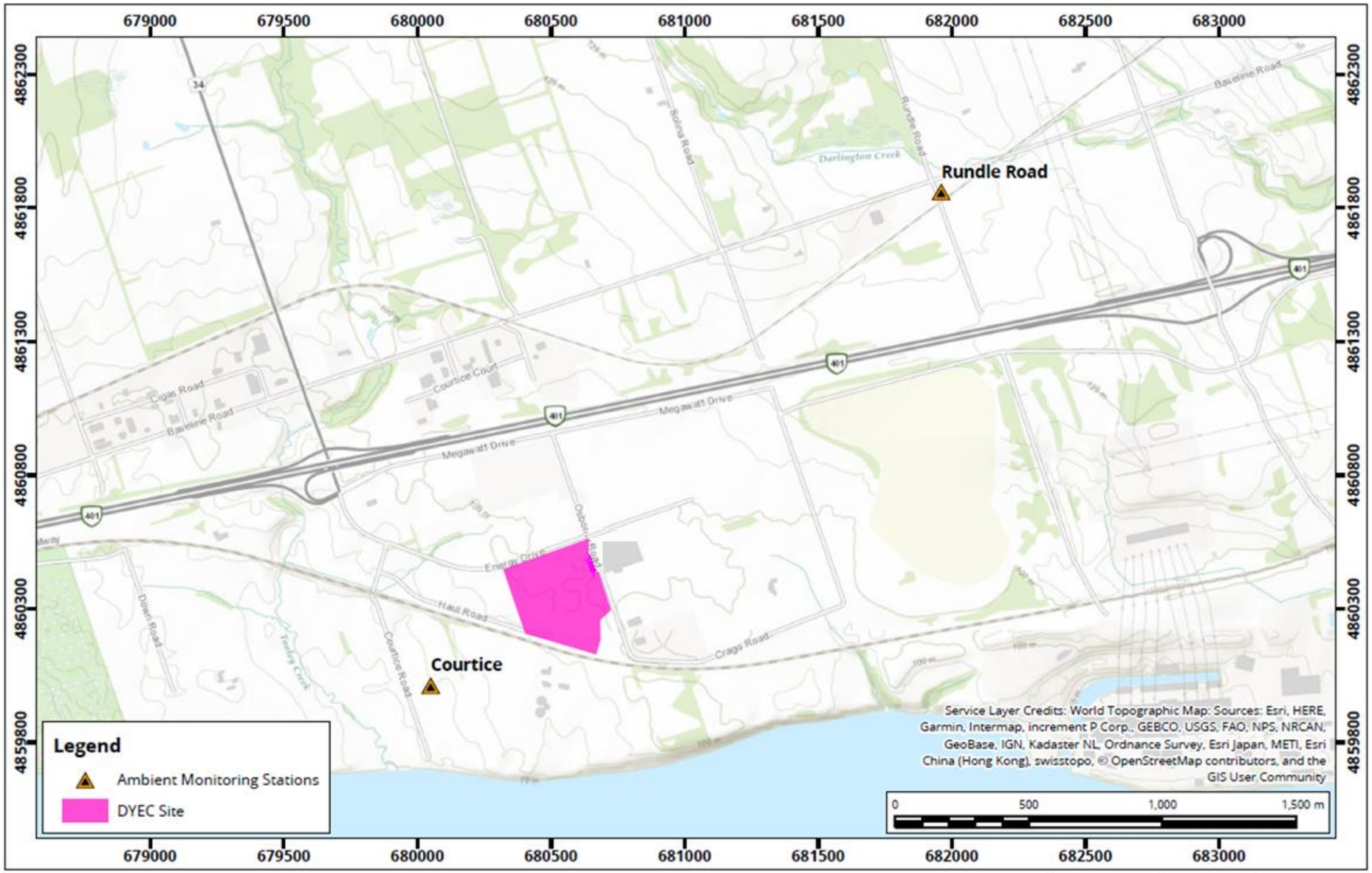
1. Quantify any measurable ground level concentrations resulting from emissions from the DYEC cumulative to local air quality, including validating the predicted concentrations from the dispersion modelling conducted in the Environmental Assessment (2009a);
2. Monitor concentration levels of EFW-related air contaminants in nearby residential areas; and,
3. Quantify background ambient levels of air contaminants in the area.

The facility has two (2) monitoring stations which collect continuous and discrete ambient measurements, known as the Courtice Station and Rundle Road Station. The station locations are shown in **Figure 1**. The Courtice and Rundle Road Stations were operational in May of 2013 and have been operated on behalf of the Region of Durham by Stantec Consulting Ltd. since that time up until July 31, 2018. RWDI has overseen the operation of the stations on behalf of the Region of Durham since August 1, 2018.

The Courtice and Rundle Road Stations continuously monitor the following air quality parameters: Particulate Matter less than 2.5 microns ($PM_{2.5}$), Nitrogen Oxides (NO_x) and Sulfur Dioxide (SO_2). In addition, both discretely monitor the following air quality parameters: Total Suspended Particulate (TSP), Metals, Dioxins and Furans (D&F) and Polycyclic Aromatic Hydrocarbons (PAHs).

Continuous meteorological data is collected at the Courtice and Rundle Road Stations. The Rundle Road Station collects the following meteorological parameters: wind speed, wind direction, ambient temperature, precipitation and relative humidity. The meteorological tower there, is approximately 10 meters tall. The Courtice Station collects the following meteorological parameters: ambient temperature, ambient pressure, precipitation and relative humidity. For purposes of this report, wind speed and wind direction data for the Courtice Station have been obtained from the adjacent Courtice Water Pollution Control Plant (WPCP) meteorological tower, which is approximately 20 meters tall.

Data recovery for all parameters measured was greater than 75% during the first quarter. This meets the quarter validity criteria. None of the measurements for any parameter were in excess of the Ambient Air Quality Criteria during the first quarter.



DYEC Site and Ambient Monitoring Station Locations

True North

Drawn by: DJH | Figure: 1

Approx. Scale: 1:20,000

Date Revised: Oct 25, 2018

Map Projection: NAD 1983 UTM Zone 17N

DYEC - Region of Durham, Ontario

Project #: 1803743

1.1 Sampling Locations

The Station sites were selected in consultation with MECP and Region of Durham representatives at the onset of the program and were chosen based on considerations of nearby receptors and agreeability with MECP siting criteria. The Courtice Station is predominantly upwind of the DYEC and is located on the Courtice WPCP property just southwest of the DYEC. The Rundle Road Station is predominantly downwind of the DYEC and is located just southeast of the intersection of Baseline Road and Rundle Road just northeast of the DYEC. Pictures of all two (2) Stations are presented as **Figure 2** and **3**.

Figure 2. Rundle Road Station

Figure 3. Courtice Station

2 SAMPLING METHODOLOGY

The Rundle Road and Courtice Stations are both equipped with the following continuous monitors: Thermo Scientific Model 5030 SHARP (Synchronized Hybrid Ambient Real-time Particulate) monitor ($PM_{2.5}$ analyzer), Teledyne Nitrogen Oxides Analyzer Model T200 (NO_x analyzer), and a Teledyne Sulfur Dioxide Analyzer Model T100 (SO_2 analyzer). Both Stations also have the following periodic monitors: High Volume (Hi-Vol) Air Sampler outfitted with a TSP inlet head as approved by the United States Environmental Protection Agency (U.S. EPA), and a Hi-Vol Air Sampler outfitted with a polyurethane foam plug and circular quartz filter for measuring PAH's and D&F's as approved by U.S. EPA.

2.1 Nitrogen Oxide Analyzers

The Teledyne T200 Nitrogen Oxide (NO_X) analyzers use chemiluminescence detection, coupled with microprocessor technology to provide sensitivity and stability for ambient air quality applications. The instrument determines real-time concentration of nitric oxide (NO), total nitrogen oxides (NO_X) (the sum of NO and NO_2), and nitrogen dioxide (NO_2). The amount of NO is measured by detecting the chemiluminescence reaction that occurs in the reaction cell when NO molecules are exposed to ozone (O_3). The NO and O_3 molecules collide in the reaction cell and enter a higher energy state. When these excited molecules return to a stable energy state, they emit a photon of light which is proportional to the amount of NO in the sample stream of gas entering the analyzer. To determine the total NO_x ($NO+NO_2$) measurement, sample gas is periodically bypassed through a heated molybdenum converter cartridge that converts any NO_2 molecules in the sample stream into NO (any existing NO molecules in the stream remain as is). The instrument will switch the sample stream through the converter periodically and then through the reaction cell where the same chemiluminescence reaction occurs with ozone. The resultant response produced is now the sum of NO and converted NO_2 producing a NO_x measurement. The resultant NO_2 determination is the NO_x measurement subtracted from the NO measurement.

The NO_X analyzers were zero and span checked daily using the internal zero and span (IZS) system and calibrated once a month using either EPA protocol span gases and a dilution system or an ESA permeation tube calibrator. Automatic IZS checks were performed on a daily basis commencing at approximately 1:45 on one day and ending at 02:10 the same day. The checks consisted of a 10-minute zero check, a 10-minute span check and a 5-minute purge. These checks provide a way to monitor daily performance of the analyzer using an external charcoal and purafil zeroing cartridge for the zero, and an internal permeation oven with a permeation tube for the span. These IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift. Data was collected at 1-minute intervals by an external datalogger using analog output connections, and was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria. The instrument also collects data using its own data acquisition system (DAS) on a 5-minute resolution.

2.2 Sulphur Dioxide Analyzers

The Teledyne T100 Sulphur Dioxide (SO_2) Analyzer is a microprocessor controlled analyzer that determines the concentration of SO_2 in a sample gas drawn through the instrument. In the sample chamber, sample gas is excited by ultraviolet light causing the SO_2 to absorb energy from the light and move to an active state (SO_2*). These active SO_2* molecules must decay into a stable state back to SO_2, and when this happens a photon of light is released which is recognized by the instrument as fluorescence. The instrument measures the amount of florescence to determine the amount of SO_2 present in the sample gas.

The SO_2 analyzers were zero and span checked daily using the IZS system and calibrated once a month using either EPA protocol span gases and a dilution system or an ESA permeation tube calibrator. Automatic IZS checks were performed on a daily basis commencing at approximately 1:45 on one day and ending at 02:10 the next day. The checks consisted of a 10-minute zero check, a 10-minute span check and a 5-minute purge. These checks provide a way to monitor daily performance of the analyzer using an external charcoal and purafil zeroing cartridge for the zero, and an internal permeation oven with a permeation tube for the span. These IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift. Data was collected at 1-

minute intervals by an external datalogger using analog output connections, and was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria. The instrument also collects data using its own data acquisition system (DAS) on a 1-hour resolution.

2.3 SHARP 5030 $PM_{2.5}$ Analyzers

The SHARP 5030 is a hybrid nephelometric/radiometric particulate mass monitor capable of providing precise, real-time measurements with a superior detection limit. The SHARP incorporates a high sensitivity light scattering photometer whose output signal is continuously referenced to the time-averaged measurement of an integral beta attenuating mass sensor. The SHARP also incorporates a dynamic inlet heating system designed to maintain the relative humidity of the air passing through the filter tape constant.

The SHARP is calibrated once a month to ensure accuracy and validity of its data. The $PM_{2.5}$ inlet head and sharp cut cyclone is cleaned monthly as well to ensure proper performance. The monthly calibration process consists of the following: zeroing the nephelometer if necessary, calibration of ambient temperature, calibration of barometric pressure, and calibration of the flow.

2.4 TSP High Volume Air Samplers

The Tisch TE-5170 TSP (Total Suspended Particulate) high volumetric air samplers (Hi-Vols) were outfitted with a TSP inlet capable of collecting particulate of all aerodynamic diameters. Each Hi-Vol is equipped with a mass flow controller, which ensures a flow rate of 40 cubic feet per minute (CFM), a chart recorder for measuring cfm flow throughout the run time, an elapsed timer and a wheel timer for starting and stopping each sample. The Hi-Vols have Teflon coated glass fibre filters that are outfitted at the top of the sampler, and air is drawn through the filter, thereby collecting all TSP. All of the TSP Hi-Vols operate on a six-day cycle, each consisting of 24-hour (midnight to midnight) samples, concurrent with the National Air Pollution Surveillance (NAPS) schedule. Each Hi-Vol is calibrated monthly to ensure accuracy and validity of the volume of air drawn through the filter.

The Teflon coated glass fibre filter media is pre and post weighed by ALS Laboratories in Burlington, Ontario. The filters are then analyzed for total particulate weight, metals analysis and mercury.

2.5 Polyurethane Foam Samplers

The Dioxins, Furans, and PAH samples were collected using Tisch TE-1000 samplers which are listed as reference devices for U.S. EPA Methods TO-9 and TO-13. The samplers use a collection filter that is 'backed-up' by a polyurethane foam (PUF) plug. The airborne compounds present in the particulate phase are collected on the Teflon coated glass fibre filter and any compounds present in the vapour phase are absorbed in the PUF plug. At the start of August, the PUF media was changed to include two PUF plugs enclosing XAD material. This was a recommendation from ALS Laboratories to achieve lower detection limits due to the stability of the compounds being absorbed into the XAD material. Each PUF sampler is equipped with a mass flow controller, which can sustain 8 cubic feet per minute (CFM) of flow over the sampling period, an elapsed timer and a wheel timer for starting and stopping each

sample. All PUF samplers operate on a twelve-day cycle, each consisting of 24-hour (midnight to midnight) samples, concurrent with the NAPS schedule. Every twelve days, the PUF plugs and filters are analyzed for PAH's, and every twenty-four days they are analyzed for both PAH's and D&F's. Each PUF sampler is calibrated monthly to ensure accuracy and validity of the volume of air drawn through the filters.

The filter and PUF media/glassware is proofed and analyzed by ALS Laboratories in Burlington, Ontario. The filters and PUF/XAD plugs are then analyzed for PAH's and D&F's.

2.6 Meteorological Towers

Meteorological data was collected from the Rundle and Courtice Stations. The Rundle and Courtice Stations are outfitted with a Campbell Scientific HMP60 Temperature/Relative Humidity probe, and a Texas Instruments TE525M rain gauge. Meteorological data was collected at 1-minute intervals and was averaged using Envista processing software over a 1-hour period.

3 AIR QUALITY CRITERIA AND STANDARDS

The monitored contaminant concentrations were compared to air quality criteria and standards set by the MECP and by Environment Canada. The MECP developed Ambient Air Quality Criteria (AAQCs) which are the maximum desirable concentrations in the outdoor air, based on effects to the environment and health (MECP, 2012). Not all contaminants have an applicable regulatory limit; therefore, other criteria were used for comparison. These included human health risk assessment (HHRA) criteria. For $PM_{2.5}$, Environment Canada has established a Canadian Ambient Air Quality Standard (CAAQS) (Environment Canada, 2013). CAAQS are health-based air quality objectives for the outdoor air. The current CAAQS' for $PM_{2.5}$ are 28 µg/m^3 for the 3-year average of annual 98th percentile 24-hour concentration, and 10 µg/m^3 for the 3-year average of annual average concentrations (in effect as of 2015). Since the 24-hour and annual CAAQS are based on the average of three calendar years of data, it should be noted that these standards do not apply to the quarterly data presented in this report.

All applicable criteria and standards are shown in the 'Summary of Ambient Measurements' section of this report.

4 MECP AUDITS

An MECP audit was completed on all continuous analyzers on February 15, 2019. Results from the audit indicated that all of the equipment was working within MECP requirements with the exception of high-volume sampler at the Courtice station.

The Courtice high volume sampler was determined to have failed due to worn out motor brushes. However, observation of the Dixon chart from the previous run which occurred a day before, the audit indicated that the unit was operational for approximately 23 hours. It should further be noted that while RWDI staff was unable to obtain an off-pressure, the Dixon chart indicated a consistent flow rate measured at the beginning and end of the run. RWDI therefore intends to validate this run based on the information provided by the Dixon chart.

On February 19, motor was replaced with a freshly re-brushed motor and calibration was performed. This was done on the next NAPS scheduled day. Since the unit was repaired prior to February 20 run and since the Dixon chart from the February 14th run indicates approximately 23 hours of run time, at a consistent flow rate, no samples were lost due to the failure of the motor to operate when checked during the audit. The unit was re-audited by the MECP on February 28, 2019 and passed the audit.

5 SUMMARY OF AMBIENT MEASUREMENTS

Ambient air quality monitoring results for all contaminants sampled at the Courtice and Rundle Road Stations are discussed herein. Summary statistics from January 1, 2019 to March 31, 2019 are presented in a summary format below and in a more detailed matrix format in **Appendix A** for continuous measurements and **Appendix B** for discrete measurements.

5.1 Meteorological Station Results

5.1.1 Courtice Station Results

The Courtice Station collected the following meteorological parameters: relative humidity, ambient temperature, ambient pressure and precipitation. For purposes of this report, wind speed and wind direction data for the Courtice Station have been obtained from the adjacent Courtice Water Pollution Control Plant (WPCP) meteorological tower, which is approximately 20 meters tall. The WPCP wind head maintained 100% data collection for windspeed and wind direction for Q1. The Courtice station maintained a minimum 99.9% of data collection for all of the parameters measured during Q1 and experienced some data loss discussed in the Data Requests section of this report. Hourly statistics from the meteorological station are presented in Table 1. A wind rose showing trends in wind speed and wind direction during Q1 is provided in **Figure 4**.

Table 1: Hourly Statistics from the Courtice WPCP Meteorological Station

Courtice Station MET Statistics	Maximum 1 hr Mean					Minimum 1 hr Mean					Monthly Mean					Total	% Valid Hours					
Parameter	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	Rain	WS	WD	Temp	RH	Pres	Rain
Units	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	mm	(%)					
January	46	7	96	30.4	3.2	0	-25	34	29.0	0.0	16	-7	67	29.8	0.0	25.8	100.0	100.0	99.9	99.9	99.9	99.9
February	54	8	96	30.4	1.3	0	-20	38	28.9	0.0	15	-4	69	29.8	0.0	16.2	100.0	100.0	100.0	100.0	100.0	100.0
March	44	10	95	30.2	2.4	0	-14	23	29.2	0.0	14	-1	65	29.8	0.0	35.6	100.0	100.0	100.0	100.0	100.0	100.0
Q1 Arithmetic Mean											15	-4	67	29.8	0.0	77.5	100.0	100.0	100.0	100.0	100.0	100.0

5.1.2 Rundle Road Station Results

The Rundle Road Station collected the following meteorological parameters: wind speed, wind direction, relative humidity, ambient temperature and precipitation. The meteorological tower at the station is at a height of approximately 10 meters tall. The Rundle Road station maintained a minimum 99.7% data collection for all of the meteorological parameters measured during Q1 and experienced some data loss discussed in the Data Requests section of this report. Hourly statistics from the meteorological station is presented in Table 2. A wind rose showing trends in wind speed and wind direction during Q1 is provided in **Figure 4**.

Table 2: Hourly Statistics from the Rundle Road Meteorological Station

Rundle Station MET Statistics	Maximum 1 hr Mean				Minimum 1 hr Mean				Monthly Mean				Total	% Valid Hours				
Parameter	WS	Temp	RH	Rain	WS	Temp	RH	Rain	WS	Temp	RH	Rain	Rain	WS	WD	Temp	RH	Rain
Units	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	mm	(%)				
January	39	7	100	2.4	0	-25	37	0.0	14	-7	71	0.0	18.0	99.7	99.7	99.7	99.7	99.7
February	44	8	100	1.8	0	-23	40	0.0	14	-5	73	0.0	14.4	100.0	100.0	100.0	100.0	100.0
March	35	9	99	3.1	0	-16	26	0.0	12	-2	69	0.1	41.6	99.7	99.7	99.7	99.7	99.7
Q1 Arithmetic Mean									13	-4	71	0.0	74.0	99.8	99.8	99.8	99.8	99.8

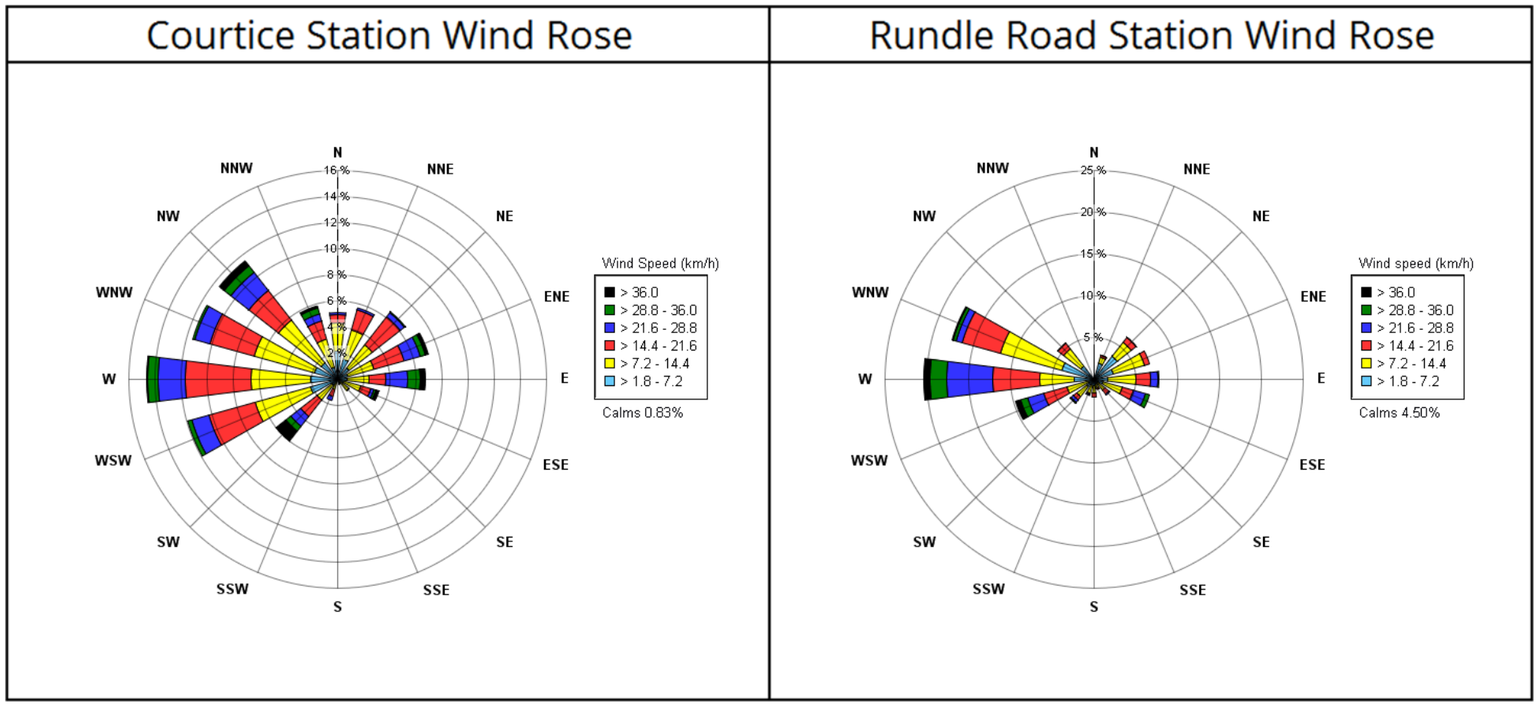


Figure 4. Wind Roses of Hourly Wind Speed and Wind Direction – January to March 2019

5.2 NO_x, SO2 and $PM_{2.5}$ Summary Table Results

Table 3 provides a summary of Maximum 1-hour Means, Maximum 24-hour Means, Monthly Means, Quarterly Means and Percent valid data for Courtice station. Table 4 provides a summary of Maximum 1-hour Means, Maximum 24-hour Means, Monthly Means, Quarterly Means and Percent valid data for Rundle station. Table 5 provides a summary of Exceedance Statistics for both Courtice and Rundle stations. There were no exceedances for any parameters at either station during this quarter.

Table 3: Summary of Percent Valid Data for Courtice Station

Courtice Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Mean					Monthly Mean					% Valid Hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
January	33	84	47	37	23	21	19	6	14	3	6	7	1	6	1	90.7	98.8	98.8	98.8	99.6
February	69	83	50	41	37	36	31	10	23	14	8	9	1	8	2	99.4	98.5	98.5	98.5	97.8
March	32	99	58	40	46	19	27	6	21	8	7	9	1	8	1	99.9	99.7	99.7	99.7	99.7
Q1 Arithmetic Mean											7	8	1	7	1	96.7	99.0	99.0	99.0	99.0

[A] The 24-hour $PM_{2.5}$ criterion applies to the 98^{th} percentile over 3 consecutive years.

Table 4: Summary of Percent Valid Data for Rundle Road Station

Rundle Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Mean					Monthly Mean					% Valid Hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
January	35	41	22	29	6	21	20	4	16	1	6	6	1	5	0	99.6	99.2	99.2	99.2	99.6
February	48	41	16	34	3	34	20	3	18	1	7	7	1	6	0	99.7	98.8	98.8	98.8	99.7
March	32	38	17	27	2	18	17	3	14	1	7	6	1	5	0	99.6	99.3	99.3	99.3	99.3
Q1 Arithmetic Mean											7	6	1	5	0	99.6	99.1	99.1	99.1	99.5

[A] The 24-hour $PM_{2.5}$ criterion applies to the 98th percentile over 3 consecutive years

Table 5: Summary of Exceedance Statistics

Event Statistics	Mean > 1 hr AAQC for Courtice Monitoring Station			Mean > 1 hr AAQC for Rundle Monitoring Station			Rolling Mean > 24 hr AAQC for Courtice Monitoring Station			Rolling Mean > 24 hr AAQC for Rundle Monitoring Station		
Compound	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2
Units	No.			No.			No.			No.		
January		0	0		0	0	N/A	0	0	N/A	0	0
February		0	0		0	0	N/A	0	0	N/A	0	0
March		0	0		0	0	N/A	0	0	N/A	0	0
Q1 Total		0	0		0	0	N/A	0	0	N/A	0	0

5.3 Oxides of Nitrogen Results

5.3.1 Courtice Station Results

Data recovery levels were high for oxides of nitrogen (99.0% valid data). Monitoring results were compared to the AAQC for NO_2 only, as it is the only parameter that has AAQC values for 1-hour and 24-hour averaging periods (there are no AAQC's for NO or NO_x). There were no exceedances above the AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest NO_2 value seen among the 1-hour averages was 41 ppb, which is 20.5% of the AAQC. The highest NO_2 value seen among the rolling 24-hour averages was 23 ppb, which is 23% of the AAQC. The measurements are summarized in Table 3 above. A pollution rose is presented in **Figure 5** for the Courtice Station during Q1 composed of hourly average NO_2 concentrations. A pollution rose indicates the percentage of time that the wind originates from a given direction coupled with the pollutant measurement for that time in either ppb or micrograms per meter cubed. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated NO_2 events at Courtice occurred when the winds were between west south-west and northwest directions. The pollution wind rose indicates that the DYEC was not a major contributor to NO_2 levels at the station.

5.3.2 Rundle Road Station Results

Data recovery levels were high for oxides of nitrogen (99.1% valid data). There were no exceedances above the AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest NO_2 value seen among the 1-hour averages was 34 ppb, which is 17 % of the AAQC. The highest NO_2 value seen among the rolling 24-hour averages was 18 ppb, which is 18% of the AAQC. The measurements are summarized in Table 4 above. A pollution rose is presented in **Figure 5** for the Rundle Road Station during Q1 composed of hourly average NO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated NO_2 events at the Rundle station occurred when winds were between the west south-west and west northwest. The pollution wind rose indicates that the DYEC was not a major contributor to NO_2 levels at the station.

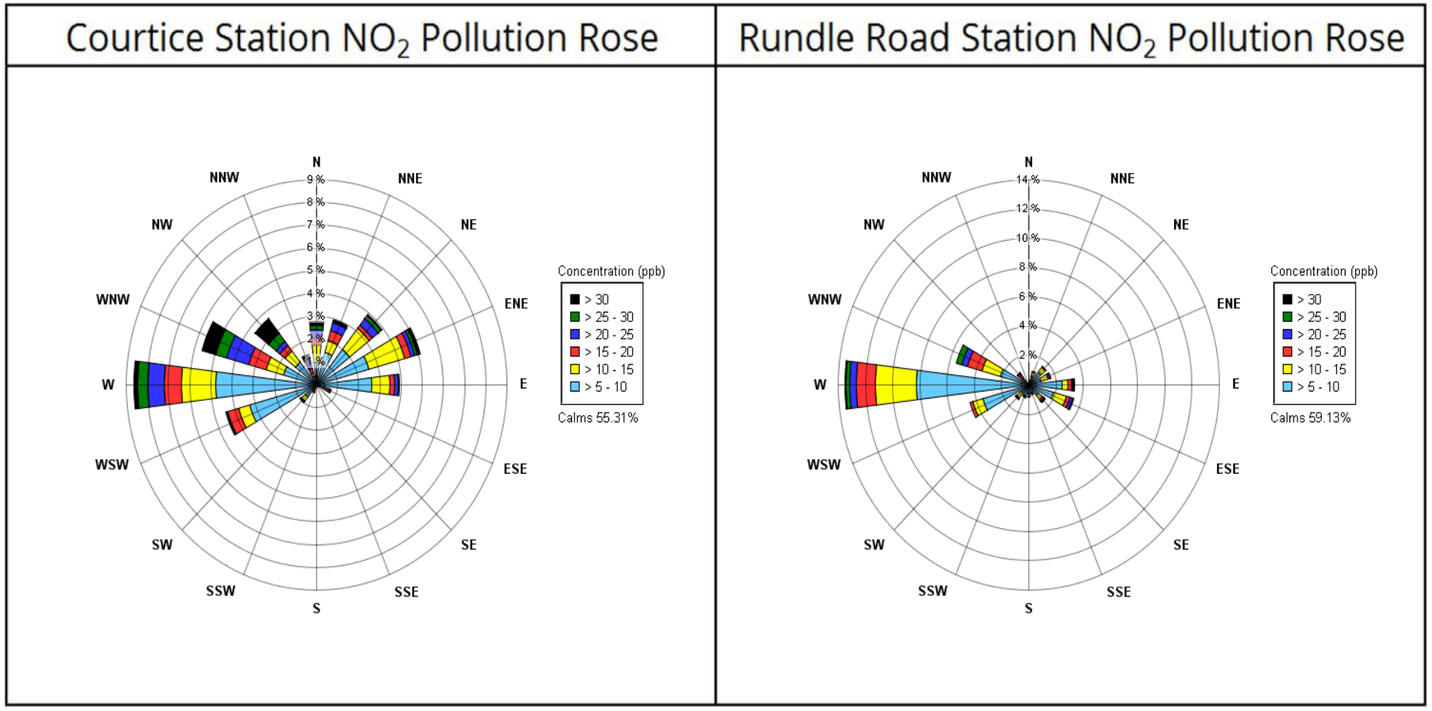


Figure 5. Pollution Roses of Hourly Average NO_2 Concentrations – January to March 2019

5.4 Sulphur Dioxide Results

5.4.1 Courtice Station Results

Data recovery levels were high for sulphur dioxide (99.0% valid data). Monitoring results were compared to the AAQC for 1-hour and 24-hour averaging periods. There were no exceedances above these AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest SO_2 value seen among the 1-hour averages was 46 ppb, which is 18.4% of the AAQC. The highest SO_2 value seen among the 24-hour averages was 14 ppb, which is 14% of the AAQC. The results are summarized in Table 3 above. A pollution rose is presented in **Figure 6** for the Courtice Station during Q1 composed of hourly average SO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated SO_2 events at Courtice occurred when the winds were from east northeast and north-northeast to north directions. The pollution wind rose indicates that it is not likely the DYEC was a major contributor to SO_2 levels at the station. These elevated levels are far below the AAQC criteria.

5.4.2 Rundle Road Station Results

Data recovery levels were high for sulphur dioxide (99.5% valid data). Monitoring results were compared to the AAQC for 1-hour and 24-hour averaging periods. There were no exceedances above these AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest SO_2 value seen among the 1-hour averages was 6 ppb, which is 2.4% of the AAQC. The highest SO_2 value seen among the 24-hour averages was 1 ppb, which is 1% of the AAQC. The results are summarized in Table 4 above. A pollution rose is presented in **Figure 6** for the Rundle Road Station during Q1 composed of hourly average SO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated SO_2 events at the Rundle station occurred when winds were from the east and northwest. The pollution wind rose indicates that the DYEC was a not major contributor to SO_2 levels at the station.

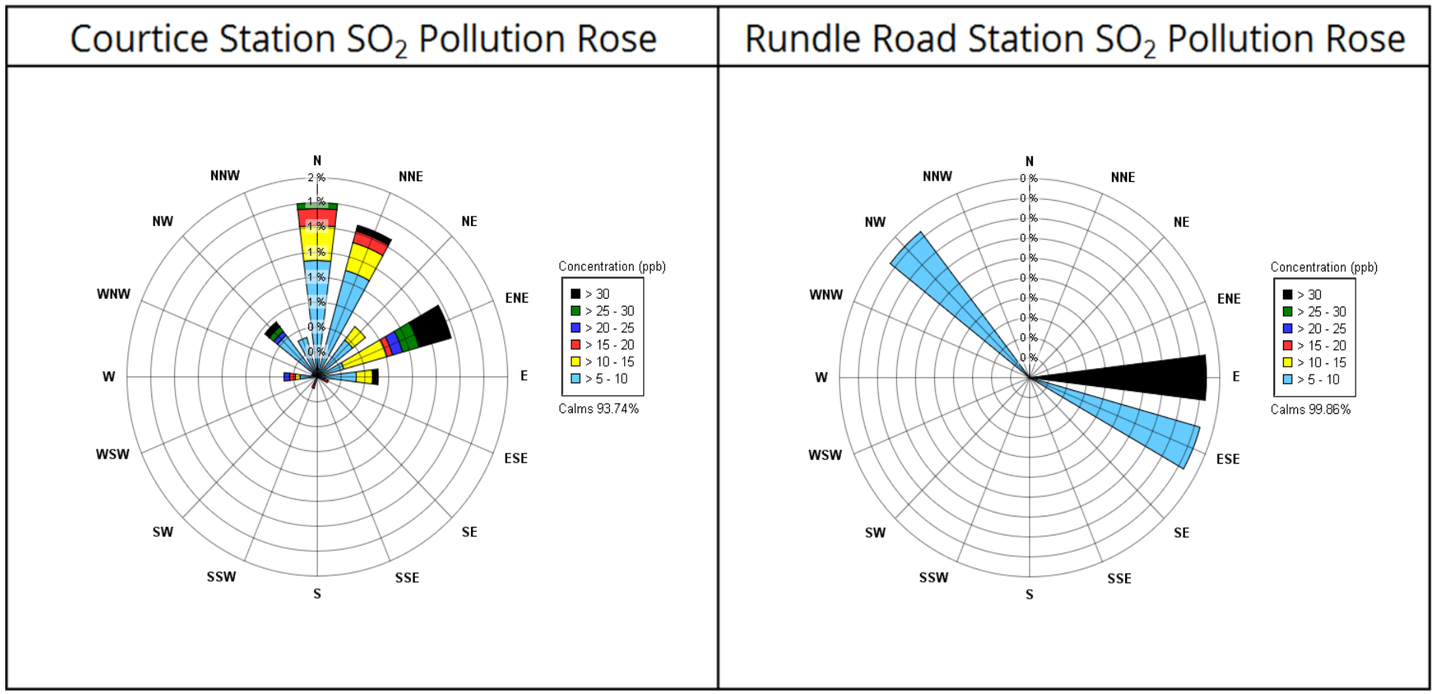


Figure 6. Pollution Roses of Hourly Average SO_2 Concentrations - January to March 2019

5.5 Fine Particulate Matter ($PM_{2.5}$) Results

5.5.1 Courtice Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (96.7% valid data). There is no 1-hour AAQC or standard for $PM_{2.5}$, but there is a 24-hour CAAQS standard of 28 µg/m^3 for the 3-year average of annual 98th percentile 24-hour concentrations, and 10 µg/m^3 for the 3-year average of annual average concentrations (in effect as of 2015). Note that since the reported data has not surpassed the 3-year average, the CAAQS' for $PM_{2.5}$ was not applicable to the data. The highest $PM_{2.5}$ value seen among the 1-hour averages was 69 µg/m^3 and the highest value seen among the rolling 24-hour averages was 36 µg/m^3. The results are summarized in Table 3 above. A pollution rose is presented in **Figure 7** for the Courtice Station during Q1 composed of hourly average $PM_{2.5}$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 µg/m^3 were omitted from the graphic wind rose representation.

The pollution rose below shows that the majority of elevated $PM_{2.5}$ events at Courtice occurred when the winds were easterly, westerly and west south-westerly directions. It is unlikely elevated $PM_{2.5}$ measurements were related to emissions from the DYEC and were more likely related to nearby roadway construction or other sources.

5.5.2 Rundle Road Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.6% valid data). The highest $PM_{2.5}$ value seen among the 1-hour averages was 48 µg/m³ and the highest value seen among the rolling 24-hour averages was 34 µg/m³. The results are summarized in Table 4 above. A pollution rose is presented in **Figure 7** for the Rundle Road Station during Q1 composed of hourly average $PM_{2.5}$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 µg/m³ were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated $PM_{2.5}$ events at the Rundle station occurred when winds were between west north-west and west south-west direction. The pollution rose indicates that elevated $PM_{2.5}$ measurements were not caused by the DYEC.

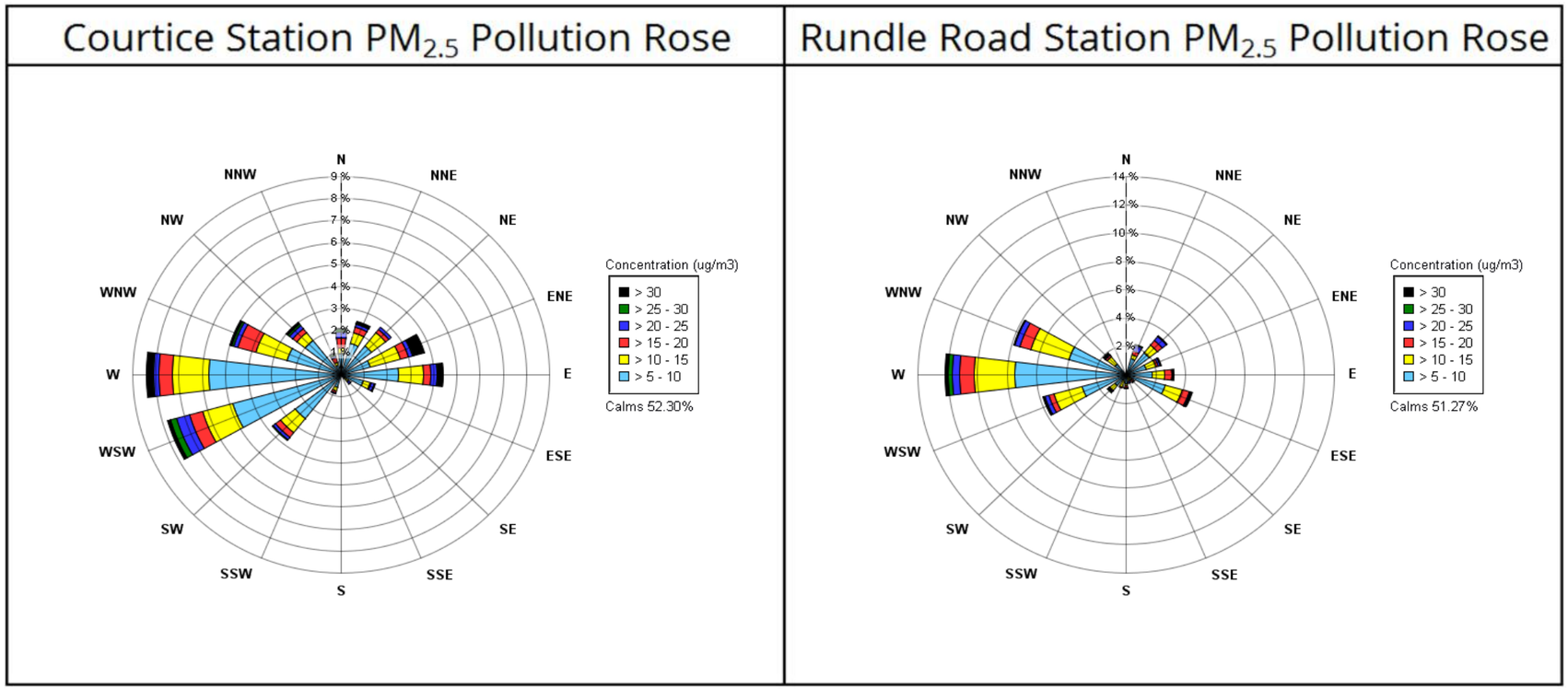


Figure 7. Pollution Roses of Hourly Average $PM_{2.5}$ Concentrations – January to March 2019

5.6 TSP and Metals Hi-Vol Results

All of the TSP Hi-Vols operated on a discrete schedule every 6 days according to the NAPS schedule during Q1 with the sample days being: January 3, 9, 15, 21, 27, February 2, 8, 14, 20, 26, and March 4, 10, 16, 22, 28, 2019.

5.6.1 Courtice Station Results

Data recovery levels were high for the TSP sampler at the Courtice Station (87% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q1. Table 6 is a summary of the statistics for this station.

Table 6: Summary of TSP Sampler Courtice Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
Particulate (TSP)	µg/m³	*120*	*120*	0	14.9	17.0	5.6	30.7	30.0	30.7	27.6	13	87
Total Mercury (Hg)	µg/m³	*2*	*2*	0	6.09E-06	9.24E-06	1.50E-06	2.31E-05	1.25E-05	2.31E-05	1.96E-05	13	87
Aluminum (Al)	µg/m³	*4.8*	-	0	9.54E-02	1.09E-01	4.10E-02	2.97E-01	2.97E-01	1.12E-01	1.83E-01	13	87
Antimony (Sb)	µg/m³	*25*	*25*	0	6.28E-04	7.18E-04	3.08E-04	1.54E-03	1.02E-03	1.54E-03	1.22E-03	13	87
Arsenic (As)	µg/m³	*0.3*	*0.3*	0	9.39E-04	9.40E-04	8.87E-04	1.04E-03	9.43E-04	1.04E-03	9.58E-04	13	87
Barium (Ba)	µg/m³	*10*	*10*	0	4.18E-03	4.72E-03	2.07E-03	1.06E-02	6.82E-03	1.06E-02	8.85E-03	13	87
Beryllium (Be)	µg/m³	*0.01*	*0.01*	0	3.13E-05	3.13E-05	2.96E-05	3.48E-05	3.14E-05	3.48E-05	3.19E-05	13	87
Bismuth (Bi)	µg/m³	-	-	-	5.63E-04	5.64E-04	5.32E-04	6.26E-04	5.66E-04	6.26E-04	5.75E-04	13	87
Boron (B)	µg/m³	*120*	-	0	1.25E-02	1.25E-02	1.18E-02	1.39E-02	1.26E-02	1.39E-02	1.28E-02	13	87
Cadmium (Cd)	µg/m³	*0.025*	*0.025*	0	6.26E-04	6.27E-04	5.91E-04	6.95E-04	6.29E-04	6.95E-04	6.39E-04	13	87
Chromium (Cr)	µg/m³	*0.5*	-	0	3.17E-03	3.53E-03	1.56E-03	6.26E-03	4.49E-03	6.26E-03	5.48E-03	13	87
Cobalt (Co)	µg/m³	*0.1*	*0.1*	0	6.26E-04	6.27E-04	5.91E-04	6.95E-04	6.29E-04	6.95E-04	6.39E-04	13	87
Copper (Cu)	µg/m³	*50*	-	0	1.92E-02	2.38E-02	6.61E-03	6.10E-02	5.49E-02	6.10E-02	1.80E-02	13	87
Iron (Fe)	µg/m³	*4*	-	0	2.45E-01	2.62E-01	1.50E-01	4.90E-01	4.04E-01	2.80E-01	4.90E-01	13	87
Lead (Pb)	µg/m³	*0.5*	*0.5*	0	1.95E-03	2.30E-03	8.91E-04	4.17E-03	3.33E-03	4.17E-03	4.01E-03	13	87
Magnesium (Mg)	µg/m³	-	-	-	1.25E-01	1.41E-01	3.30E-02	2.63E-01	2.63E-01	1.50E-01	2.61E-01	13	87
Manganese (Mn)	µg/m³	*0.4*	-	0	7.88E-03	8.68E-03	4.11E-03	1.67E-02	1.44E-02	9.95E-03	1.67E-02	13	87
Molybdenum (Mo)	µg/m³	*120*	-	0	5.77E-04	7.61E-04	2.97E-04	2.20E-03	2.20E-03	1.51E-03	1.40E-03	13	87
Nickel (Ni)	µg/m³	*0.2*	-	0	1.02E-03	1.09E-03	8.87E-04	2.87E-03	9.43E-04	1.04E-03	2.87E-03	13	87
Phosphorus (P)	µg/m³	-	-	-	2.35E-01	2.35E-01	2.22E-01	2.61E-01	2.36E-01	2.61E-01	2.40E-01	13	87
Selenium (Se)	µg/m³	*10*	*10*	0	3.13E-03	3.13E-03	2.96E-03	3.48E-03	3.14E-03	3.48E-03	3.19E-03	13	87
Silver (Ag)	µg/m³	*1*	*1*	0	3.13E-04	3.13E-04	2.96E-04	3.48E-04	3.14E-04	3.48E-04	3.19E-04	13	87
Strontium (Sr)	µg/m³	*120*	-	0	2.36E-03	2.77E-03	8.87E-04	5.73E-03	4.85E-03	3.41E-03	5.73E-03	13	87
Thallium (Tl)	µg/m³	-	-	-	3.10E-05	3.35E-05	2.66E-05	9.81E-05	2.83E-05	3.13E-05	9.81E-05	13	87
Tin (Sn)	µg/m³	*10*	*10*	0	7.92E-04	1.01E-03	2.97E-04	2.52E-03	2.52E-03	1.51E-03	1.34E-03	13	87
Titanium (Ti)	µg/m³	*120*	-	0	4.07E-03	4.52E-03	3.25E-03	1.31E-02	1.31E-02	3.82E-03	7.64E-03	13	87

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
Uranium (Ur)	µg/m³	*1.5*	-	0	3.13E-05	3.13E-05	2.96E-05	3.48E-05	3.14E-05	3.48E-05	3.19E-05	13	87
Vanadium (V)	µg/m³	*2*	*1*	0	1.67E-03	1.72E-03	1.48E-03	3.63E-03	1.57E-03	1.74E-03	3.63E-03	13	87
Zinc (Zn)	µg/m³	*120*	-	0	4.20E-02	5.10E-02	2.01E-02	1.66E-01	7.69E-02	1.66E-01	3.67E-02	13	87
Zirconium (Zr)	µg/m³	*20*	-	0	6.26E-04	6.27E-04	5.91E-04	6.95E-04	6.29E-04	6.95E-04	6.39E-04	13	87

Note: All non-detectable results were reported as 1/2 of the detection limit

5.6.2 Rundle Road Station Results

Data recovery levels were high for the TSP sampler at the Rundle Road Station (87% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q1. Table 7 is a summary of the statistics for this station.

Table 7: Summary of TSP Sampler Rundle Road Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
Particulate (TSP)	µg/m³	*120*	*120*	0	18.1	20.2	6.6	43.6	43.6	30.7	32.4	13	87
Total Mercury (Hg)	µg/m³	*2*	*2*	0	3.68E-06	5.90E-06	1.47E-06	1.71E-05	7.84E-06	1.71E-05	1.32E-05	13	87
Aluminum (Al)	µg/m³	*4.8*	-	0	1.22E-01	1.52E-01	4.79E-02	4.25E-01	2.99E-01	4.25E-01	2.64E-01	13	87
Antimony (Sb)	µg/m³	*25*	*25*	0	3.29E-04	4.76E-04	7.41E-05	1.46E-03	7.66E-04	1.46E-03	1.23E-03	13	87
Arsenic (As)	µg/m³	*0.3*	*0.3*	0	9.23E-04	9.24E-04	8.84E-04	9.60E-04	9.33E-04	9.48E-04	9.60E-04	13	87
Barium (Ba)	µg/m³	*10*	*10*	0	4.23E-03	5.12E-03	1.62E-03	1.20E-02	8.55E-03	1.15E-02	1.20E-02	13	87
Beryllium (Be)	µg/m³	*0.01*	*0.01*	0	3.08E-05	3.08E-05	2.95E-05	3.20E-05	3.11E-05	3.16E-05	3.20E-05	13	87
Bismuth (Bi)	µg/m³	-	-	-	5.54E-04	5.54E-04	5.31E-04	5.76E-04	5.60E-04	5.69E-04	5.76E-04	13	87
Boron (B)	µg/m³	*120*	-	0	1.23E-02	1.23E-02	1.18E-02	1.28E-02	1.24E-02	1.26E-02	1.28E-02	13	87
Cadmium (Cd)	µg/m³	*0.025*	*0.025*	0	6.16E-04	6.16E-04	5.90E-04	6.40E-04	6.22E-04	6.32E-04	6.40E-04	13	87
Chromium (Cr)	µg/m³	*0.5*	-	0	3.33E-03	3.66E-03	1.50E-03	6.30E-03	4.05E-03	5.49E-03	6.30E-03	13	87
Cobalt (Co)	µg/m³	*0.1*	*0.1*	0	6.16E-04	6.16E-04	5.90E-04	6.40E-04	6.22E-04	6.32E-04	6.40E-04	13	87
Copper (Cu)	µg/m³	*50*	-	0	1.58E-02	1.74E-02	8.38E-03	4.47E-02	1.93E-02	4.47E-02	1.94E-02	13	87
Iron (Fe)	µg/m³	*4*	-	0	2.55E-01	2.95E-01	1.14E-01	5.78E-01	5.12E-01	5.77E-01	5.78E-01	13	87
Lead (Pb)	µg/m³	*0.5*	*0.5*	0	1.74E-03	2.11E-03	8.90E-04	5.11E-03	2.95E-03	5.11E-03	4.07E-03	13	87
Magnesium (Mg)	µg/m³	-	-	-	1.42E-01	1.75E-01	3.16E-02	4.25E-01	3.60E-01	4.25E-01	3.12E-01	13	87
Manganese (Mn)	µg/m³	*0.4*	-	0	8.82E-03	1.11E-02	3.00E-03	2.32E-02	1.97E-02	2.32E-02	2.31E-02	13	87

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
Molybdenum (Mo)	µg/m³	*120*	-	0	4.30E-04	5.67E-04	2.95E-04	2.20E-03	3.11E-04	2.20E-03	1.27E-03	13	87
Nickel (Ni)	µg/m³	*0.2*	-	0	9.92E-04	1.04E-03	8.84E-04	2.42E-03	9.33E-04	9.48E-04	2.42E-03	13	87
Phosphorus (P)	µg/m³	-	-	-	2.31E-01	2.31E-01	2.21E-01	2.40E-01	2.33E-01	2.37E-01	2.40E-01	13	87
Selenium (Se)	µg/m³	*10*	*10*	0	3.08E-03	3.08E-03	2.95E-03	3.20E-03	3.11E-03	3.16E-03	3.20E-03	13	87
Silver (Ag)	µg/m³	*1*	*1*	0	3.08E-04	3.08E-04	2.95E-04	3.20E-04	3.11E-04	3.16E-04	3.20E-04	13	87
Strontium (Sr)	µg/m³	*120*	-	0	3.18E-03	3.94E-03	9.00E-04	9.35E-03	8.37E-03	5.67E-03	9.35E-03	13	87
Thallium (Tl)	µg/m³	-	-	-	2.95E-05	3.04E-05	2.65E-05	6.36E-05	2.80E-05	2.84E-05	6.36E-05	13	87
Tin (Sn)	µg/m³	*10*	*10*	0	7.06E-04	8.72E-04	2.97E-04	1.95E-03	1.95E-03	1.61E-03	1.21E-03	13	87
Titanium (Ti)	µg/m³	*120*	-	0	4.73E-03	5.44E-03	3.27E-03	1.25E-02	1.25E-02	8.63E-03	1.02E-02	13	87
Uranium (Ur)	µg/m³	*1.5*	-	0	3.08E-05	3.08E-05	2.95E-05	3.20E-05	3.11E-05	3.16E-05	3.20E-05	13	87
Vanadium (V)	µg/m³	*2*	*1*	0	1.65E-03	1.73E-03	1.47E-03	4.07E-03	1.56E-03	1.58E-03	4.07E-03	13	87
Zinc (Zn)	µg/m³	*120*	-	0	2.72E-02	3.03E-02	1.25E-02	5.87E-02	5.87E-02	4.92E-02	3.70E-02	13	87
Zirconium (Zr)	µg/m³	*20*	-	0	6.16E-04	6.16E-04	5.90E-04	6.40E-04	6.22E-04	6.32E-04	6.40E-04	13	87

Note: All non-detectable results were reported as 1/2 of the detection limit

5.7 PAH Results

All of the PUF Hi-Vols operated on a discrete schedule every 12 days for PAH's according to the NAPS schedule during Q1 with the sample days being: January 9, 21, February 2, 14, 26 March 10, 22, 2019.

5.7.1 Courtice Station Results

Data recovery levels were high for the PAH results at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the PAH's during Q1. Table 8 is a summary of the statistics for this station.

Table 8: Statistics Summary of PAH Results for Courtice Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Arithmetic Mean	Minimum Q1 Concentration	Maximum Q1 Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
1-Methylnaphthalene	ng/m³	*12000*	-	0	1.65E+00	2.50E-02	4.22E+00	1.19E+00	4.22E+00	2.20E+00	7	100
2-Methylnaphthalene	ng/m³	*10000*	-	0	2.52E+00	2.88E-04	7.18E+00	1.75E+00	7.18E+00	2.60E+00	7	100
Acenaphthene	ng/m³	-	-	-	2.50E-01	6.74E-03	4.81E-01	2.46E-01	4.40E-01	4.81E-01	7	100
Acenaphthylene	ng/m³	*3500*	-	0	1.02E-01	2.88E-04	4.95E-01	6.49E-02	4.95E-01	2.13E-02	7	100
Anthracene	ng/m³	*200*	-	0	3.14E-02	5.73E-03	8.66E-02	2.40E-02	8.66E-02	2.58E-02	7	100
Benzo(a)Anthracene	ng/m³	-	-	-	8.27E-03	2.88E-04	1.84E-02	6.85E-03	1.84E-02	8.98E-03	7	100

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Arithmetic Mean	Minimum Q1 Concentration	Maximum Q1 Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
Benzo(a)fluorene	ng/m³	-	-	-	1.72E-02	1.10E-03	6.68E-02	1.14E-02	6.68E-02	9.25E-03	7	100
Benzo(a)Pyrene	ng/m³	*0.05*[1] *5*[2] *1.1*[3]	*1*	0	1.46E-02	1.50E-03	3.43E-02	6.07E-03	3.43E-02	1.64E-02	7	100
Benzo(b)Fluoranthene	ng/m³	-	-	-	2.28E-02	2.88E-04	8.03E-02	1.24E-02	8.03E-02	1.73E-02	7	100
Benzo(b)fluorene	ng/m³	-	-	-	7.99E-03	1.15E-03	2.20E-02	4.58E-03	2.20E-02	5.34E-03	7	100
Benzo(e)Pyrene	ng/m³	-	-	-	2.43E-02	7.99E-03	6.13E-02	3.20E-02	6.13E-02	1.67E-02	7	100
Benzo(g,h,i)Perylene	ng/m³	-	-	-	2.02E-02	9.51E-04	5.89E-02	1.40E-02	5.89E-02	1.73E-02	7	100
Benzo(k)Fluoranthene	ng/m³	-	-	-	2.33E-02	2.88E-04	7.07E-02	1.30E-02	7.07E-02	2.29E-02	7	100
Biphenyl	ng/m³	-	-	-	7.91E-01	1.19E-02	2.01E+00	6.52E-01	2.01E+00	7.52E-01	7	100
Chrysene	ng/m³	-	-	-	4.23E-02	5.16E-03	1.30E-01	2.25E-02	1.30E-01	2.73E-02	7	100
Dibenzo(a,h)Anthracene	ng/m³	-	-	-	3.69E-03	1.17E-03	1.03E-02	1.03E-02	6.22E-03	1.60E-03	7	100
Fluoranthene	ng/m³	-	-	-	1.94E-01	1.36E-02	5.51E-01	1.53E-01	5.51E-01	1.73E-01	7	100
Indeno(1,2,3-cd)Pyrene	ng/m³	-	-	-	1.90E-02	2.88E-04	4.60E-02	1.43E-02	4.60E-02	1.79E-02	7	100
Naphthalene	ng/m³	*22500*	*22500*	0	9.49E+00	3.46E-01	2.63E+01	6.13E+00	2.63E+01	8.89E+00	7	100
o-Terphenyl	ng/m³	-	-	-	5.94E-03	9.22E-04	1.77E-02	4.38E-03	1.77E-02	4.58E-03	7	100
Perylene	ng/m³	-	-	-	5.44E-03	8.17E-04	1.54E-02	4.38E-03	1.54E-02	1.90E-03	7	100
Phenanthrene	ng/m³	-	-	-	7.41E-01	1.95E-02	1.98E+00	5.98E-01	1.98E+00	7.26E-01	7	100
Pyrene	ng/m³	-	-	-	1.09E-01	1.41E-02	3.25E-01	9.38E-02	3.25E-01	9.27E-02	7	100
Tetralin	ng/m³	-	-	-	1.06E+00	4.03E-01	2.60E+00	8.45E-01	2.60E+00	1.26E+00	7	100
Total PAH[4]	ng/m³	-	-	-	1.72E+01	9.04E-01	4.68E+01	1.19E+01	4.68E+01	1.74E+01	7	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] AAQC
[2] O. Reg. 419/05 Schedule 6 Upper Risk Thresholds
[3] O. Reg. 419/05 24 Hour Guideline
[4] Total PAH sums all PAH contaminants

5.7.2 Rundle Road Station Results

Data recovery levels were high for the PAH results at the Rundle Road Station (86% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the PAH's during Q1. Table 9 is a summary of the statistics for this station.

Table 9: Statistics Summary of PAH Results for Rundle Road Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Arithmetic Mean	Minimum Q1 Concentration	Maximum Q1 Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
1-Methylnaphthalene	ng/m^3	*12000*	-	0	2.01E+00	9.97E-01	5.25E+00	1.11E+00	5.25E+00	1.50E+00	6	86
2-Methylnaphthalene	ng/m^3	*10000*	-	0	3.20E+00	1.40E+00	8.84E+00	1.62E+00	8.84E+00	1.93E+00	6	86
Acenaphthene	ng/m^3	-	-	-	3.08E-01	1.18E-01	6.51E-01	1.24E-01	5.16E-01	6.51E-01	6	86
Acenaphthylene	ng/m^3	*3500*	-	0	1.34E-01	1.03E-02	5.63E-01	8.22E-02	5.63E-01	2.77E-02	6	86
Anthracene	ng/m^3	*200*	-	0	3.56E-02	9.46E-03	6.78E-02	1.84E-02	6.78E-02	4.88E-02	6	86
Benzo(a)Anthracene	ng/m^3	-	-	-	1.43E-02	3.30E-03	3.32E-02	3.32E-02	2.07E-02	9.60E-03	6	86
Benzo(a)fluorene	ng/m^3	-	-	-	2.63E-02	1.03E-02	6.00E-02	4.02E-02	6.00E-02	1.54E-02	6	86
Benzo(a)Pyrene	ng/m^3	*0.05*[1] *5*[2] *1.1*[3]	*1*	0	1.74E-02	2.74E-03	3.31E-02	2.81E-02	3.31E-02	1.71E-02	6	86
Benzo(b)Fluoranthene	ng/m^3	-	-	-	3.53E-02	8.66E-03	9.44E-02	4.02E-02	9.44E-02	1.85E-02	6	86
Benzo(b)fluorene	ng/m^3	-	-	-	1.30E-02	4.89E-03	2.43E-02	2.43E-02	2.23E-02	8.21E-03	6	86
Benzo(e)Pyrene	ng/m^3	-	-	-	3.13E-02	4.49E-03	7.47E-02	4.80E-02	7.47E-02	1.68E-02	6	86
Benzo(g,h,i)Perylene	ng/m^3	-	-	-	2.93E-02	8.29E-03	6.75E-02	3.41E-02	6.75E-02	1.86E-02	6	86
Benzo(k)Fluoranthene	ng/m^3	-	-	-	3.57E-02	9.44E-03	1.06E-01	3.50E-02	1.06E-01	2.25E-02	6	86
Biphenyl	ng/m^3	-	-	-	1.04E+00	5.82E-01	2.56E+00	8.76E-01	2.56E+00	7.41E-01	6	86
Chrysene	ng/m^3	-	-	-	5.92E-02	2.03E-02	1.53E-01	8.46E-02	1.53E-01	3.18E-02	6	86
Dibenzo(a,h)Anthracene	ng/m^3	-	-	-	3.20E-03	9.66E-04	7.38E-03	4.32E-03	7.38E-03	1.60E-03	6	86
Fluoranthene	ng/m^3	-	-	-	2.78E-01	1.46E-01	6.38E-01	2.13E-01	6.38E-01	2.17E-01	6	86
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	-	2.37E-02	6.26E-03	5.19E-02	2.93E-02	5.19E-02	1.74E-02	6	86
Naphthalene	ng/m^3	*22500*	*22500*	0	1.27E+01	5.73E+00	3.13E+01	1.04E+01	3.13E+01	8.50E+00	6	86
o-Terphenyl	ng/m^3	-	-	-	6.64E-03	2.66E-03	1.98E-02	4.74E-03	1.98E-02	4.20E-03	6	86
Perylene	ng/m^3	-	-	-	4.41E-03	1.31E-03	8.44E-03	6.32E-03	8.44E-03	1.91E-03	6	86
Phenanthrene	ng/m^3	-	-	-	1.04E+00	5.89E-01	2.33E+00	6.10E-01	2.33E+00	1.09E+00	6	86
Pyrene	ng/m^3	-	-	-	1.70E-01	9.78E-02	3.69E-01	1.39E-01	3.69E-01	1.10E-01	6	86
Tetralin	ng/m^3	-	-	-	1.33E+00	5.64E-01	3.41E+00	9.18E-01	3.41E+00	7.96E-01	6	86
Total PAH[4]	ng/m^3	-	-	-	2.26E+01	1.06E+01	5.65E+01	1.65E+01	5.65E+01	1.47E+01	6	86

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] AAQC
[2] O. Reg. 419/05 Schedule 6 Upper Risk Thresholds
[3] O. Reg. 419/05 24 Hour Guideline
[4] Total PAH sums all PAH contaminants

5.8 Dioxin and Furan Results

All of the PUF Hi-Vols operated on a discrete schedule every 24 days for D&F's according to the NAPS schedule during Q1 with the sample days being: January 21, February 14, and March 10, 2019.

5.8.1 Courtice Station Results

Data recovery levels were acceptable for the D&F results at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q1. Table 10 is a summary of the statistics for this station.

Table 10: Courtice Station Q1 Monitoring Results for Dioxins and Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	MECP Criteria (µg/m³)	No. > Criteria	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
2,3,7,8-TCDD	pg/m³	-	-	-	-	6.67E-04	4.96E-04	8.21E-04	8.21E-04	6.85E-04	4.96E-04	3	100
1,2,3,7,8-PeCDD	pg/m³	-	-	-	-	3.15E-04	2.31E-04	4.23E-04	2.31E-04	4.23E-04	2.92E-04	3	100
1,2,3,4,7,8-HxCDD	pg/m³	-	-	-	-	6.80E-04	2.02E-04	1.28E-03	2.02E-04	5.54E-04	1.28E-03	3	100
1,2,3,6,7,8-HxCDD	pg/m³	-	-	-	-	6.99E-04	2.02E-04	1.02E-03	2.02E-04	8.75E-04	1.02E-03	3	100
1,2,3,7,8,9-HxCDD	pg/m³	-	-	-	-	1.20E-03	2.02E-04	1.72E-03	2.02E-04	1.72E-03	1.69E-03	3	100
1,2,3,4,6,7,8-HpCDD	pg/m³	-	-	-	-	1.20E-02	3.11E-03	2.15E-02	3.11E-03	2.15E-02	1.14E-02	3	100
OCDD	pg/m³	-	-	-	-	6.26E-02	2.34E-02	1.20E-01	2.34E-02	1.20E-01	4.46E-02	3	100
2,3,7,8-TCDF	pg/m³	-	-	-	-	9.02E-04	3.94E-04	1.84E-03	4.76E-04	1.84E-03	3.94E-04	3	100
1,2,3,7,8-PeCDF	pg/m³	-	-	-	-	1.36E-03	2.45E-04	2.59E-03	2.45E-04	2.59E-03	1.23E-03	3	100
2,3,4,7,8-PeCDF	pg/m³	-	-	-	-	1.43E-03	2.31E-04	3.53E-03	2.31E-04	3.53E-03	5.25E-04	3	100
1,2,3,4,7,8-HxCDF	pg/m³	-	-	-	-	2.04E-03	2.02E-04	5.54E-03	2.02E-04	5.54E-03	3.94E-04	3	100
1,2,3,6,7,8-HxCDF	pg/m³	-	-	-	-	5.73E-04	1.87E-04	1.11E-03	1.87E-04	1.11E-03	4.23E-04	3	100
2,3,4,6,7,8-HxCDF	pg/m³	-	-	-	-	1.25E-03	2.02E-04	3.15E-03	2.02E-04	3.15E-03	4.08E-04	3	100
1,2,3,7,8,9-HxCDF	pg/m³	-	-	-	-	5.13E-04	3.50E-04	6.56E-04	5.33E-04	3.50E-04	6.56E-04	3	100
1,2,3,4,6,7,8-HpCDF	pg/m³	-	-	-	-	6.59E-03	1.73E-04	1.57E-02	1.73E-04	1.57E-02	3.91E-03	3	100
1,2,3,4,7,8,9-HpCDF	pg/m³	-	-	-	-	2.31E-03	2.16E-04	6.06E-03	2.16E-04	6.06E-03	6.42E-04	3	100
OCDF	pg/m³	-	-	-	-	1.31E-02	4.44E-03	2.91E-02	4.44E-03	2.91E-02	5.89E-03	3	100
Total Toxic Equivalency	pg TEQ/m³	*0.1 1*[1]	-	0.1	0	2.47E-03	1.39E-03	4.23E-03	1.39E-03	4.23E-03	1.78E-03	3	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

5.8.2 Rundle Road Station Results

Data recovery levels were acceptable for the D&F results at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q1. Table 11 is a summary of the statistics for this station.

Table 11: Rundle Road Station Q1 Monitoring Results for Dioxins and Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	MECP Criteria (µg/m³)	No. > Criteria	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid Data
2,3,7,8-TCDD	pg/m³	-	-	-	-	1.07E-03	8.41E-04	1.50E-03	8.76E-04	1.50E-03	8.41E-04	3	100
1,2,3,7,8-PeCDD	pg/m³	-	-	-	-	3.97E-04	2.87E-04	5.30E-04	2.87E-04	5.30E-04	3.74E-04	3	100
1,2,3,4,7,8-HxCDD	pg/m³	-	-	-	-	5.80E-04	4.52E-04	6.85E-04	6.04E-04	6.85E-04	4.52E-04	3	100
1,2,3,6,7,8-HxCDD	pg/m³	-	-	-	-	5.97E-04	4.68E-04	8.26E-04	4.68E-04	8.26E-04	4.98E-04	3	100
1,2,3,7,8,9-HxCDD	pg/m³	-	-	-	-	5.75E-04	4.67E-04	6.70E-04	5.89E-04	6.70E-04	4.67E-04	3	100
1,2,3,4,6,7,8-HpCDD	pg/m³	-	-	-	-	1.42E-02	1.26E-02	1.71E-02	1.28E-02	1.71E-02	1.26E-02	3	100
OCDD	pg/m³	-	-	-	-	4.93E-02	4.26E-02	5.83E-02	4.26E-02	5.83E-02	4.70E-02	3	100
2,3,7,8-TCDF	pg/m³	-	-	-	-	8.04E-04	5.44E-04	1.23E-03	5.44E-04	1.23E-03	6.39E-04	3	100
1,2,3,7,8-PeCDF	pg/m³	-	-	-	-	6.40E-04	3.63E-04	1.07E-03	3.63E-04	1.07E-03	4.83E-04	3	100
2,3,4,7,8-PeCDF	pg/m³	-	-	-	-	5.83E-04	3.47E-04	1.04E-03	3.47E-04	1.04E-03	3.58E-04	3	100
1,2,3,4,7,8-HxCDF	pg/m³	-	-	-	-	6.09E-04	3.47E-04	1.06E-03	3.47E-04	1.06E-03	4.21E-04	3	100
1,2,3,6,7,8-HxCDF	pg/m³	-	-	-	-	6.61E-04	3.32E-04	9.03E-04	3.32E-04	9.03E-04	7.48E-04	3	100
2,3,4,6,7,8-HxCDF	pg/m³	-	-	-	-	9.26E-04	3.47E-04	2.06E-03	3.47E-04	2.06E-03	3.74E-04	3	100
1,2,3,7,8,9-HxCDF	pg/m³	-	-	-	-	1.01E-03	3.43E-04	2.24E-03	4.38E-04	2.24E-03	3.43E-04	3	100
1,2,3,4,6,7,8-HpCDF	pg/m³	-	-	-	-	3.49E-03	1.36E-03	6.92E-03	2.21E-03	6.92E-03	1.36E-03	3	100
1,2,3,4,7,8,9-HpCDF	pg/m³	-	-	-	-	8.64E-04	3.02E-04	1.34E-03	3.02E-04	9.50E-04	1.34E-03	3	100
OCDF	pg/m³	-	-	-	-	4.98E-03	2.02E-03	9.47E-03	3.44E-03	9.47E-03	2.02E-03	3	100
Total Toxic Equivalency	pg TEQ/m³	*0.1 1*[1]	-	0.1	0	2.44E-03	1.81E-03	3.61E-03	1.81E-03	3.61E-03	1.90E-03	3	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

6 DATA REQUESTS

The following sections outline any instrumentation issues encountered that have caused data loss at any of the monitors at each of the stations.

Appendix C contains monthly IZS zero trends for the NO_x and SO_2 analyzers at the Courtice and Rundle Road Stations.

Edit logs identifying missing data, maintenance times, calibrations and any other missing data have been included in **Appendix D**.

6.1 Courtice Road Station

On December 30, 2018 the TSP unit had a tape break occur. The tape was replaced on January 3, 2019 at 18:00 at which point the unit resumed operating.

On January 4, 2019 between 12:00 and 13:00 there was a suspected power failure that affected all contaminant and meteorological parameters.

On January 31, 2019 the permeation tube was replaced in the SO_2 analyzer which was then calibrated.

On February 6, 2019 the SO_2 analyzer experienced a malfunction between 10:00 and 16:00. The following day on February 7, 2019 the SO_2 analyzer was checked and ensured that it was in working order.

The TSP sample on February 26, 2019 was invalid due to an excessive sample volume collected. The TSP sample on March 10, 2019 was invalid due to an insufficient sample volume collected.

6.2 Rundle Road Station

On January 4, 2019 between 10:00 to 11:00 and on January 7, 2019 between 14:00 to 15:00 there were suspected power failures that affected all contaminant and meteorological parameters.

The TSP sample on February 26, 2019 was invalid due to an excessive sample volume collected. The TSP sample on March 10, 2019 was invalid due to an insufficient sample volume collected.

7 CONCLUSIONS

This Q1 report provides a summary of the ambient air quality data collected at the Courtice and Rundle Road stations. Throughout this monitoring period, there were no exceedances of any AAQC or HHRA Health Based Criteria. Data recovery rates were acceptable and valid for all measured Q1 parameters.

8 REFERENCES

1. Canadian Council of Ministers of the Environment, 2012. Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone. PN 1483 978-1-896997-91-9 PDF
2. Environment Canada, 2013. Canadian Ambient Air Quality Standards. [Online]
3. Ontario Ministry of the Environment and Climate Change, 2012. [Standards Development Branch] Ontario's Ambient Air Quality Criteria (Sorted by Contaminant Name). PIBS #6570e01

APPENDIX A

Table A1: 2019 Summary Statistics for Q1

Courtice Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Mean					Monthly Mean					% valid hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
January	33	84	47	37	23	21	19	6	14	3	6	7	1	6	1	90.7	98.8	98.8	98.8	99.6
February	69	83	50	41	37	36	31	10	23	14	8	9	1	8	2	99.4	98.5	98.5	98.5	97.8
March	32	99	58	40	46	19	27	6	21	8	7	9	1	8	1	99.9	99.7	99.7	99.7	99.7
Q1 Arithmetic Mean											7	8	1	7	1	96.7	99.0	99.0	99.0	99.0

Rundle Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Mean					Monthly Mean					% valid hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
January	35	41	22	29	6	21	20	4	16	1	6	6	1	5	0	99.6	99.2	99.2	99.2	99.6
February	48	41	16	34	3	34	20	3	18	1	7	7	1	6	0	99.7	98.8	98.8	98.8	99.7
March	32	38	17	27	2	18	17	3	14	1	7	6	1	5	0	99.6	99.3	99.3	99.3	99.3
Q1 Arithmetic Mean											7	6	1	5	0	99.6	99.1	99.1	99.1	99.5

Event Statistics	Mean > 1 hr AAQC for Courtice Monitoring Station			Mean > 1 hr AAQC for Rundle Monitoring Station			Rolling Mean > 24 hr AAQC for Courtice Monitoring Station			Rolling Mean > 24 hr AAQC for Rundle Monitoring Station		
Compound	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2
Units	No.			No.			No.			No.		
January		0	0		0	0	N/A	0	0	N/A	0	0
February		0	0		0	0	N/A	0	0	N/A	0	0
March		0	0		0	0	N/A	0	0	N/A	0	0
Q1 Total		0	0		0	0	N/A	0	0	N/A	0	0

Courtice Station MET Statistics	Maximum 1 hr Mean					Minimum 1 hr Mean					Monthly Mean					Total	% valid hours					
Parameter	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	Rain	WS	WD	Temp	RH	Pres	Rain
Units	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	mm	(%)					
January	46	7	96	30.4	3.2	0	-25	34	29.0	0.0	16	-7	67	29.8	0.0	25.8	100.0	100.0	99.9	99.9	99.9	99.9
February	54	8	96	30.4	1.3	0	-20	38	28.9	0.0	15	-4	69	29.8	0.0	16.2	100.0	100.0	100.0	100.0	100.0	100.0
March	44	10	95	30.2	2.4	0	-14	23	29.2	0.0	14	-1	65	29.8	0.0	35.6	100.0	100.0	100.0	100.0	100.0	100.0
Q1 Arithmetic Mean											15	-4	67	29.8	0.0	77.5	100.0	100.0	100.0	100.0	100.0	100.0

Rundle Station MET Statistics	Maximum 1 hr Mean				Minimum 1 hr Mean				Monthly Mean				Total	% valid hours				
Parameter	WS	Temp	RH	Rain	WS	Temp	RH	Rain	WS	Temp	RH	Rain	Rain	WS	WD	Temp	RH	Rain
Units	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	mm	(%)				
January	39	7	100	2.4	0	-25	37	0.0	14	-7	71	0.0	18.0	99.7	99.7	99.7	99.7	99.7
February	44	8	100	1.8	0	-23	40	0.0	14	-5	73	0.0	14.4	100.0	100.0	100.0	100.0	100.0
March	35	9	99	3.1	0	-16	26	0.0	12	-2	69	0.1	41.6	99.7	99.7	99.7	99.7	99.7
Q1 Arithmetic Mean									13	-4	71	0.0	74.0	99.8	99.8	99.8	99.8	99.8

Table A2: 2019 Q1 Station Courtice Monitoring Results for $PM_{2.5}$

Data Statistics	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	No.	%
January	N/A	6	33	21	675	90.7
February	N/A	8	69	36	668	99.4
March	N/A	7	32	19	743	99.9

Table A3: 2019 Q1 Station Rundle Monitoring Results for $PM_{2.5}$

Data Statistics	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	No.	%
January	N/A	6	35	21	741	99.6
February	N/A	7	48	34	670	99.7
March	N/A	7	32	18	741	99.6

Table A4: 2019 Q1 Station Courtice Monitoring Results for NOx

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	N/A	N/A	7	84	19	735	98.8
February	N/A	N/A	9	83	31	662	98.5
March	N/A	N/A	9	99	27	742	99.7

Table A5: 2019 Q1 Station Rundle Monitoring Results for NOx

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	N/A	N/A	6	41	20	738	99.2
February	N/A	N/A	7	41	20	664	98.8
March	N/A	N/A	6	38	17	739	99.3

Table A6: 2019 Q1 Station Courtice Monitoring Results for NO

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO	NO	NO	NO	NO	NO	NO
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	N/A	N/A	1	47	6	735	98.8
February	N/A	N/A	1	50	10	662	98.5
March	N/A	N/A	1	58	6	742	99.7

Table A7: 2019 Q1 Station Rundle Monitoring Results for NO

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO	NO	NO	NO	NO	NO	NO
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	N/A	N/A	1	22	4	738	99.2
February	N/A	N/A	1	16	3	664	98.8
March	N/A	N/A	1	17	3	739	99.3

Table A8: 2019 Q1 Station Courtice Monitoring Results for NO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	0	0	6	37	14	735	98.8
February	0	0	8	41	23	662	98.5
March	0	0	8	40	21	742	99.7

Table A9: 2019 Q1 Station Rundle Monitoring Results for NO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	0	0	5	29	16	738	99.2
February	0	0	6	34	18	664	98.8
March	0	0	5	27	14	739	99.3

Table A10: 2019 Q1 Station Courtice Monitoring Results for SO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	0	0	1	23	3	741	99.6
February	0	0	2	37	14	657	97.8
March	0	0	1	46	8	742	99.7

Table A11: 2019 Q1 Station Rundle Monitoring Results for SO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
January	0	0	0	6	1	741	99.6
February	0	0	0	3	1	670	99.7
March	0	0	0	2	1	739	99.3

Table A12: 2019 Q1 Courtice Meterological Station Windspeed Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Wind Speed	Wind Speed	Wind Speed	Wind Speed
	(km/hr)	(km/hr)	(km/hr)	(%)
January	46	0	16	100.0
February	54	0	15	100.0
March	44	0	14	100.0

Table A13: 2019 Q1 Rundle Meterological Station Windspeed Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Wind Speed	Wind Speed	Wind Speed	Wind Speed
	(km/hr)	(km/hr)	(km/hr)	(%)
January	39	0	14	99.7
February	44	0	14	100.0
March	35	0	12	99.7

Table A14: 2019 Q1 Courtice Meterological Station Wind Direction Data Summary

MET Statistics	% valid hours
Month	Wind Direction (%)
January	100.0
February	100.0
March	100.0

Table A15: 2019 Q1 Rundle Meterological Station Wind Direction Data Summary

MET Statistics	% valid hours
Month	Wind Direction (%)
January	99.7
February	100.0
March	99.7

Table A16: 2019 Q1 Courtice Meterological Station Temperature Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Temperature	Temperature	Temperature	Temperature
	(°C)	(°C)	(°C)	(%)
January	7	-25	-7	99.9
February	8	-20	-4	100.0
March	10	-14	-1	100.0

Table A17: 2019 Q1 Rundle Meterological Station Temperature Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Temperature	Temperature	Temperature	Temperature
	(°C)	(°C)	(°C)	(%)
January	7	-25	-7	99.7
February	8	-23	-5	100.0
March	9	-16	-2	99.7

Table A18: 2019 Q1 Courtice Meterological Station Relative Humidity Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	% valid hours
Month	Relative Humidity	Relative Humidity	Relative Humidity	Relative Humidity
	(%)	(%)	(%)	(%)
January	96	34	67	99.9
February	96	38	69	100.0
March	95	23	65	100.0

Table A19: 2019 Q1 Rundle Meterological Station Relative Humidity Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	% valid hours
Month	Relative Humidity	Relative Humidity	Relative Humidity	Relative Humidity
	(%)	(%)	(%)	(%)
January	100	37	71	99.7
February	100	40	73	100.0
March	99	26	69	99.7

Table A20: 2019 Q1 Courtice Meterological Station Precipitation Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	Total	% valid hours
Month	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation
	(mm)	(mm)	(mm)	(mm)	(mm)
January	3.2	0.0	0.0	25.8	99.9
February	1.3	0.0	0.0	16.2	100.0
March	2.4	0.0	0.0	35.6	100.0

Table A21: 2019 Q1 Rundle Meterological Station Precipitation Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	Total	% valid hours
Month	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation
	(mm)	(mm)	(mm)	(mm)	(mm)
January	2.4	0.0	0.0	18.0	99.7
February	1.8	0.0	0.0	14.4	100.0
March	3.1	0.0	0.1	41.6	99.7

Table A22: 2019 Q1 Courtice Meterological Station Pressure Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Pressure	Pressure	Pressure	Pressure
	(mmHg)	(mmHg)	(mmHg)	(%)
January	30.4	29.0	29.8	99.9
February	30.4	28.9	29.8	100.0
March	30.2	29.2	29.8	100.0

APPENDIX B

Table B1: Summary of Sample Flow Rate and Sample Duration for Dioxins & Furans

Sample Date	Courtice			Rundle		
	Filter ID	Sample Duration	Sample Volume	Filter ID	Sample Duration	Sample Volume
	No.	(min)	(m^3)	No.	(min)	(m^3)
January 21, 2019	L2216886-3	1482	347	L2216686-4	1432	331
February 14, 2019	L2228368-3	1432	343	L2228368-2	1445	321
March 10, 2019	L2238276-2	1430	343	L2238276-3	1428	321

Table B2: 2019 Courtice Station Q1 Monitoring Results for Dioxins & Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	21-Jan-19	14-Feb-19	10-Mar-19
2,3,7,8-TCDD	pg/m^3	-	-	8.21E-04	6.85E-04	4.96E-04
1,2,3,7,8-PeCDD	pg/m^3	-	-	2.31E-04	4.23E-04	2.92E-04
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	2.02E-04	5.54E-04	1.28E-03
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	2.02E-04	8.75E-04	1.02E-03
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	2.02E-04	1.72E-03	1.69E-03
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	3.11E-03	2.15E-02	1.14E-02
OCDD	pg/m^3	-	-	2.34E-02	1.20E-01	4.46E-02
2,3,7,8-TCDF	pg/m^3	-	-	4.76E-04	1.84E-03	3.94E-04
1,2,3,7,8-PeCDF	pg/m^3	-	-	2.45E-04	2.59E-03	1.23E-03
2,3,4,7,8-PeCDF	pg/m^3	-	-	2.31E-04	3.53E-03	5.25E-04
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	2.02E-04	5.54E-03	3.94E-04
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	1.87E-04	1.11E-03	4.23E-04
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	2.02E-04	3.15E-03	4.08E-04
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	5.33E-04	3.50E-04	6.56E-04
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	1.73E-04	1.57E-02	3.91E-03
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	2.16E-04	6.06E-03	6.42E-04
OCDF	pg/m^3	-	-	4.44E-03	2.91E-02	5.89E-03
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1* [1]	-	1.39E-03	4.23E-03	1.78E-03

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

Table B2: 2019 Courtice Station Q1 Monitoring Results for Dioxins & Furans

Contaminant	MECP Criteria (µg/m^3)	No. > Criteria	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	-	-	6.67E-04	4.96E-04	8.21E-04	8.21E-04	6.85E-04	4.96E-04	3	100
1,2,3,7,8-PeCDD	-	-	3.15E-04	2.31E-04	4.23E-04	2.31E-04	4.23E-04	2.92E-04	3	100
1,2,3,4,7,8-HxCDD	-	-	6.80E-04	2.02E-04	1.28E-03	2.02E-04	5.54E-04	1.28E-03	3	100
1,2,3,6,7,8-HxCDD	-	-	6.99E-04	2.02E-04	1.02E-03	2.02E-04	8.75E-04	1.02E-03	3	100
1,2,3,7,8,9-HxCDD	-	-	1.20E-03	2.02E-04	1.72E-03	2.02E-04	1.72E-03	1.69E-03	3	100
1,2,3,4,6,7,8-HpCDD	-	-	1.20E-02	3.11E-03	2.15E-02	3.11E-03	2.15E-02	1.14E-02	3	100
OCDD	-	-	6.26E-02	2.34E-02	1.20E-01	2.34E-02	1.20E-01	4.46E-02	3	100
2,3,7,8-TCDF	-	-	9.02E-04	3.94E-04	1.84E-03	4.76E-04	1.84E-03	3.94E-04	3	100
1,2,3,7,8-PeCDF	-	-	1.36E-03	2.45E-04	2.59E-03	2.45E-04	2.59E-03	1.23E-03	3	100
2,3,4,7,8-PeCDF	-	-	1.43E-03	2.31E-04	3.53E-03	2.31E-04	3.53E-03	5.25E-04	3	100
1,2,3,4,7,8-HxCDF	-	-	2.04E-03	2.02E-04	5.54E-03	2.02E-04	5.54E-03	3.94E-04	3	100
1,2,3,6,7,8-HxCDF	-	-	5.73E-04	1.87E-04	1.11E-03	1.87E-04	1.11E-03	4.23E-04	3	100
2,3,4,6,7,8-HxCDF	-	-	1.25E-03	2.02E-04	3.15E-03	2.02E-04	3.15E-03	4.08E-04	3	100
1,2,3,7,8,9-HxCDF	-	-	5.13E-04	3.50E-04	6.56E-04	5.33E-04	3.50E-04	6.56E-04	3	100
1,2,3,4,6,7,8-HpCDF	-	-	6.59E-03	1.73E-04	1.57E-02	1.73E-04	1.57E-02	3.91E-03	3	100
1,2,3,4,7,8,9-HpCDF	-	-	2.31E-03	2.16E-04	6.06E-03	2.16E-04	6.06E-03	6.42E-04	3	100
OCDF	-	-	1.31E-02	4.44E-03	2.91E-02	4.44E-03	2.91E-02	5.89E-03	3	100
Total Toxic Equivalency	0.1	0	2.47E-03	1.39E-03	4.23E-03	1.39E-03	4.23E-03	1.78E-03	3	100

Table B3: 2019 Rundle Station Q1 Monitoring Results for Dioxins & Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	21-Jan-19	14-Feb-19	10-Mar-19
2,3,7,8-TCDD	pg/m^3	-	-	8.76E-04	1.50E-03	8.41E-04
1,2,3,7,8-PeCDD	pg/m^3	-	-	2.87E-04	5.30E-04	3.74E-04
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	6.04E-04	6.85E-04	4.52E-04
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	4.68E-04	8.26E-04	4.98E-04
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	5.89E-04	6.70E-04	4.67E-04
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	1.28E-02	1.71E-02	1.26E-02
OCDD	pg/m^3	-	-	4.26E-02	5.83E-02	4.70E-02
2,3,7,8-TCDF	pg/m^3	-	-	5.44E-04	1.23E-03	6.39E-04
1,2,3,7,8-PeCDF	pg/m^3	-	-	3.63E-04	1.07E-03	4.83E-04
2,3,4,7,8-PeCDF	pg/m^3	-	-	3.47E-04	1.04E-03	3.58E-04
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	3.47E-04	1.06E-03	4.21E-04
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	3.32E-04	9.03E-04	7.48E-04
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	3.47E-04	2.06E-03	3.74E-04
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	4.38E-04	2.24E-03	3.43E-04
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	2.21E-03	6.92E-03	1.36E-03
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	3.02E-04	9.50E-04	1.34E-03
OCDF	pg/m^3	-	-	3.44E-03	9.47E-03	2.02E-03
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1* [1]	-	1.81E-03	3.61E-03	1.90E-03

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

Table B3: 2019 Rundle Station Q1 Monitoring Results for Dioxins & Furans

Contaminant	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	-	-	1.07E-03	8.41E-04	1.50E-03	8.76E-04	1.50E-03	8.41E-04	3	100
1,2,3,7,8-PeCDD	-	-	3.97E-04	2.87E-04	5.30E-04	2.87E-04	5.30E-04	3.74E-04	3	100
1,2,3,4,7,8-HxCDD	-	-	5.80E-04	4.52E-04	6.85E-04	6.04E-04	6.85E-04	4.52E-04	3	100
1,2,3,6,7,8-HxCDD	-	-	5.97E-04	4.68E-04	8.26E-04	4.68E-04	8.26E-04	4.98E-04	3	100
1,2,3,7,8,9-HxCDD	-	-	5.75E-04	4.67E-04	6.70E-04	5.89E-04	6.70E-04	4.67E-04	3	100
1,2,3,4,6,7,8-HpCDD	-	-	1.42E-02	1.26E-02	1.71E-02	1.28E-02	1.71E-02	1.26E-02	3	100
OCDD	-	-	4.93E-02	4.26E-02	5.83E-02	4.26E-02	5.83E-02	4.70E-02	3	100
2,3,7,8-TCDF	-	-	8.04E-04	5.44E-04	1.23E-03	5.44E-04	1.23E-03	6.39E-04	3	100
1,2,3,7,8-PeCDF	-	-	6.40E-04	3.63E-04	1.07E-03	3.63E-04	1.07E-03	4.83E-04	3	100
2,3,4,7,8-PeCDF	-	-	5.83E-04	3.47E-04	1.04E-03	3.47E-04	1.04E-03	3.58E-04	3	100
1,2,3,4,7,8-HxCDF	-	-	6.09E-04	3.47E-04	1.06E-03	3.47E-04	1.06E-03	4.21E-04	3	100
1,2,3,6,7,8-HxCDF	-	-	6.61E-04	3.32E-04	9.03E-04	3.32E-04	9.03E-04	7.48E-04	3	100
2,3,4,6,7,8-HxCDF	-	-	9.26E-04	3.47E-04	2.06E-03	3.47E-04	2.06E-03	3.74E-04	3	100
1,2,3,7,8,9-HxCDF	-	-	1.01E-03	3.43E-04	2.24E-03	4.38E-04	2.24E-03	3.43E-04	3	100
1,2,3,4,6,7,8-HpCDF	-	-	3.49E-03	1.36E-03	6.92E-03	2.21E-03	6.92E-03	1.36E-03	3	100
1,2,3,4,7,8,9-HpCDF	-	-	8.64E-04	3.02E-04	1.34E-03	3.02E-04	9.50E-04	1.34E-03	3	100
OCDF	-	-	4.98E-03	2.02E-03	9.47E-03	3.44E-03	9.47E-03	2.02E-03	3	100
Total Toxic Equivalency	0.1	0	2.44E-03	1.81E-03	3.61E-03	1.81E-03	3.61E-03	1.90E-03	3	100

Table B4: Summary of Sample Flow Rate and Sample Duration for PAHs

Sample Date	Courtice			Rundle		
	Filter ID	Sample Duration	Sample Volume	Filter ID	Sample Duration	Sample Volume
	No.	(min)	(m^3)	No.	(min)	(m^3)
January 9, 2019	L2214432-3	1430	336	L2214432-2	1435	323
January 21, 2019	L2216886-3	1482	347	L2216686-4	1432	331
February 2, 2019	L2221967-2	1426	341	L2221967-3	1428	320
February 14, 2019	L2228368-3	1432	343	L2228368-2	1445	321
February 26, 2019	L2232916-2	1310	318	Invalid Sample	Invalid Sample	Invalid Sample
March 10, 2019	L2238276-2	1430	343	L2238276-3	1428	321
March 22, 2019	L2242652-3	1429	343	l2242652-2	1434	324

Table B5: 2019 Courtice Station Q1 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	9-Jan-19	21-Jan-19	2-Feb-19	14-Feb-19	26-Feb-19	10-Mar-19	22-Mar-19
1-Methylnaphthalene	ng/m^3	*12000*	-	1.19E+00	2.50E-02	4.22E+00	2.27E+00	7.74E-01	8.61E-01	2.20E+00
2-Methylnaphthalene	ng/m^3	*10000*	-	1.75E+00	2.88E-04	7.18E+00	3.76E+00	1.06E+00	1.28E+00	2.60E+00
Acenaphthene	ng/m^3	-	-	2.46E-01	6.74E-03	4.40E-01	2.00E-01	1.12E-01	2.66E-01	4.81E-01
Acenaphthylene	ng/m^3	*3500*	-	6.49E-02	2.88E-04	4.95E-01	5.15E-02	7.46E-02	5.95E-03	2.13E-02
Anthracene	ng/m^3	*200*	-	2.40E-02	5.73E-03	3.64E-02	2.22E-02	8.66E-02	1.93E-02	2.58E-02
Benzo(a)Anthracene	ng/m^3	-	-	6.85E-03	2.88E-04	1.84E-02	5.65E-03	1.15E-02	6.21E-03	8.98E-03
Benzo(a)fluorene	ng/m^3	-	-	1.14E-02	1.10E-03	6.68E-02	1.04E-02	1.37E-02	9.25E-03	8.05E-03
Benzo(a)Pyrene	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	6.07E-03	1.50E-03	2.91E-02	1.05E-02	3.43E-02	3.94E-03	1.64E-02
Benzo(b)Fluoranthene	ng/m^3	-	-	1.24E-02	2.88E-04	8.03E-02	2.73E-02	1.44E-02	7.79E-03	1.73E-02
Benzo(b)fluorene	ng/m^3	-	-	4.58E-03	1.15E-03	2.20E-02	6.06E-03	1.18E-02	4.96E-03	5.34E-03
Benzo(e)Pyrene	ng/m^3	-	-	1.50E-02	3.20E-02	6.13E-02	1.79E-02	1.95E-02	7.99E-03	1.67E-02
Benzo(g,h,i)Perylene	ng/m^3	-	-	1.40E-02	9.51E-04	5.89E-02	1.95E-02	2.23E-02	8.05E-03	1.73E-02
Benzo(k)Fluoranthene	ng/m^3	-	-	1.30E-02	2.88E-04	7.07E-02	1.87E-02	2.83E-02	9.39E-03	2.29E-02
Biphenyl	ng/m^3	-	-	6.52E-01	1.19E-02	2.01E+00	1.04E+00	4.78E-01	5.86E-01	7.52E-01
Chrysene	ng/m^3	-	-	2.25E-02	5.16E-03	1.30E-01	3.12E-02	6.11E-02	1.87E-02	2.73E-02
Dibenzo(a,h)Anthracene	ng/m^3	-	-	1.31E-03	1.03E-02	6.22E-03	3.55E-03	1.70E-03	1.17E-03	1.60E-03
Fluoranthene	ng/m^3	-	-	1.53E-01	1.36E-02	5.51E-01	1.66E-01	1.73E-01	1.29E-01	1.73E-01
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	1.43E-02	2.88E-04	4.60E-02	1.79E-02	2.93E-02	6.97E-03	1.79E-02
Naphthalene	ng/m^3	*22500*	*22500*	6.13E+00	3.46E-01	2.63E+01	1.02E+01	6.26E+00	8.26E+00	8.89E+00
o-Terphenyl	ng/m^3	-	-	4.38E-03	9.22E-04	1.77E-02	9.43E-03	2.36E-03	2.25E-03	4.58E-03
Perylene	ng/m^3	-	-	4.38E-03	3.49E-03	1.00E-02	2.07E-03	1.54E-02	8.17E-04	1.90E-03
Phenanthrene	ng/m^3	-	-	5.98E-01	1.95E-02	1.98E+00	8.24E-01	5.04E-01	5.37E-01	7.26E-01
Pyrene	ng/m^3	-	-	9.38E-02	1.41E-02	3.25E-01	9.05E-02	8.44E-02	6.13E-02	9.27E-02
Tetralin	ng/m^3	-	-	8.45E-01	4.03E-01	2.60E+00	1.32E+00	4.44E-01	5.31E-01	1.26E+00
Total PAH[4]	ng/m^3	-	-	1.19E+01	9.04E-01	4.68E+01	2.01E+01	1.03E+01	1.26E+01	1.74E+01

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants

Table B5: 2019 Courtice Station Q1 Monitoring Results for PAHs

Contaminant	MECP Criteria (µg/m^3)	No. > Criteria	Arithmetic Mean	Minimum Q1 Concentration	Maximum Q1 Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	12000	0	1.65E+00	2.50E-02	4.22E+00	1.19E+00	4.22E+00	2.20E+00	7	100
2-Methylnaphthalene	10000	0	2.52E+00	2.88E-04	7.18E+00	1.75E+00	7.18E+00	2.60E+00	7	100
Acenaphthene	-	-	2.50E-01	6.74E-03	4.81E-01	2.46E-01	4.40E-01	4.81E-01	7	100
Acenaphthylene	3500	0	1.02E-01	2.88E-04	4.95E-01	6.49E-02	4.95E-01	2.13E-02	7	100
Anthracene	200	0	3.14E-02	5.73E-03	8.66E-02	2.40E-02	8.66E-02	2.58E-02	7	100
Benzo(a)Anthracene	-	-	8.27E-03	2.88E-04	1.84E-02	6.85E-03	1.84E-02	8.98E-03	7	100
Benzo(a)fluorene	-	-	1.72E-02	1.10E-03	6.68E-02	1.14E-02	6.68E-02	9.25E-03	7	100
Benzo(a)Pyrene	0.05	0	1.46E-02	1.50E-03	3.43E-02	6.07E-03	3.43E-02	1.64E-02	7	100
Benzo(b)Fluoranthene	-	-	2.28E-02	2.88E-04	8.03E-02	1.24E-02	8.03E-02	1.73E-02	7	100
Benzo(b)fluorene	-	-	7.99E-03	1.15E-03	2.20E-02	4.58E-03	2.20E-02	5.34E-03	7	100
Benzo(e)Pyrene	-	-	2.43E-02	7.99E-03	6.13E-02	3.20E-02	6.13E-02	1.67E-02	7	100
Benzo(g,h,i)Perylene	-	-	2.02E-02	9.51E-04	5.89E-02	1.40E-02	5.89E-02	1.73E-02	7	100
Benzo(k)Fluoranthene	-	-	2.33E-02	2.88E-04	7.07E-02	1.30E-02	7.07E-02	2.29E-02	7	100
Biphenyl	-	-	7.91E-01	1.19E-02	2.01E+00	6.52E-01	2.01E+00	7.52E-01	7	100
Chrysene	-	-	4.23E-02	5.16E-03	1.30E-01	2.25E-02	1.30E-01	2.73E-02	7	100
Dibenzo(a,h)Anthracene	-	-	3.69E-03	1.17E-03	1.03E-02	1.03E-02	6.22E-03	1.60E-03	7	100
Fluoranthene	-	-	1.94E-01	1.36E-02	5.51E-01	1.53E-01	5.51E-01	1.73E-01	7	100
Indeno(1,2,3-cd)Pyrene	-	-	1.90E-02	2.88E-04	4.60E-02	1.43E-02	4.60E-02	1.79E-02	7	100
Naphthalene	22500	0	9.49E+00	3.46E-01	2.63E+01	6.13E+00	2.63E+01	8.89E+00	7	100
o-Terphenyl	-	-	5.94E-03	9.22E-04	1.77E-02	4.38E-03	1.77E-02	4.58E-03	7	100
Perylene	-	-	5.44E-03	8.17E-04	1.54E-02	4.38E-03	1.54E-02	1.90E-03	7	100
Phenanthrene	-	-	7.41E-01	1.95E-02	1.98E+00	5.98E-01	1.98E+00	7.26E-01	7	100
Pyrene	-	-	1.09E-01	1.41E-02	3.25E-01	9.38E-02	3.25E-01	9.27E-02	7	100
Tetralin	-	-	1.06E+00	4.03E-01	2.60E+00	8.45E-01	2.60E+00	1.26E+00	7	100
Total PAH[4]	-	-	1.72E+01	9.04E-01	4.68E+01	1.19E+01	4.68E+01	1.74E+01	7	100

Table B6: 2019 Rundle Station Q1 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	9-Jan-19	21-Jan-19	2-Feb-19	14-Feb-19	26-Feb-19	10-Mar-19	22-Mar-19
1-Methylnaphthalene	ng/m^3	*12000*	-	9.97E-01	1.11E+00	5.25E+00	2.20E+00	Invalid Sample	1.00E+00	1.50E+00
2-Methylnaphthalene	ng/m^3	*10000*	-	1.40E+00	1.62E+00	8.84E+00	3.68E+00		1.71E+00	1.93E+00
Acenaphthene	ng/m^3	-	-	1.24E-01	1.18E-01	5.16E-01	2.69E-01		6.51E-01	1.70E-01
Acenaphthylene	ng/m^3	*3500*	-	7.52E-02	8.22E-02	5.63E-01	4.36E-02		1.03E-02	2.77E-02
Anthracene	ng/m^3	*200*	-	1.84E-02	9.46E-03	6.78E-02	3.46E-02		3.46E-02	4.88E-02
Benzo(a)Anthracene	ng/m^3	-	-	6.35E-03	3.32E-02	2.07E-02	1.26E-02		3.30E-03	9.60E-03
Benzo(a)fluorene	ng/m^3	-	-	1.37E-02	4.02E-02	6.00E-02	1.84E-02		1.03E-02	1.54E-02
Benzo(a)Pyrene	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	6.01E-03	2.81E-02	3.31E-02	1.71E-02		2.74E-03	1.71E-02
Benzo(b)Fluoranthene	ng/m^3	-	-	1.32E-02	4.02E-02	9.44E-02	3.68E-02		8.66E-03	1.85E-02
Benzo(b)fluorene	ng/m^3	-	-	4.89E-03	2.43E-02	2.23E-02	1.24E-02		5.73E-03	8.21E-03
Benzo(e)Pyrene	ng/m^3	-	-	1.61E-02	4.80E-02	7.47E-02	2.77E-02		4.49E-03	1.68E-02
Benzo(g,h,i)Perylene	ng/m^3	-	-	1.15E-02	3.41E-02	6.75E-02	3.58E-02		8.29E-03	1.86E-02
Benzo(k)Fluoranthene	ng/m^3	-	-	9.44E-03	3.50E-02	1.06E-01	2.99E-02		1.15E-02	2.25E-02
Biphenyl	ng/m^3	-	-	5.82E-01	8.76E-01	2.56E+00	8.22E-01		7.41E-01	6.76E-01
Chrysene	ng/m^3	-	-	2.03E-02	8.46E-02	1.53E-01	4.58E-02		2.05E-02	3.18E-02
Dibenzo(a,h)Anthracene	ng/m^3	-	-	1.11E-03	4.32E-03	7.38E-03	3.80E-03		9.66E-04	1.60E-03
Fluoranthene	ng/m^3	-	-	1.46E-01	2.13E-01	6.38E-01	2.67E-01		2.17E-01	1.86E-01
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	1.14E-02	2.93E-02	5.19E-02	2.58E-02		6.26E-03	1.74E-02
Naphthalene	ng/m^3	*22500*	*22500*	5.73E+00	1.04E+01	3.13E+01	1.27E+01		8.50E+00	7.69E+00
o-Terphenyl	ng/m^3	-	-	4.74E-03	2.66E-03	1.98E-02	5.02E-03		3.43E-03	4.20E-03
Perylene	ng/m^3	-	-	6.32E-03	5.86E-03	8.44E-03	2.62E-03		1.31E-03	1.91E-03
Phenanthrene	ng/m^3	-	-	6.10E-01	5.89E-01	2.33E+00	8.97E-01		1.09E+00	7.35E-01
Pyrene	ng/m^3	-	-	9.78E-02	1.39E-01	3.69E-01	1.98E-01		1.10E-01	1.07E-01
Tetralin	ng/m^3	-	-	7.34E-01	9.18E-01	3.41E+00	1.56E+00		5.64E-01	7.96E-01
Total PAH[4]	ng/m^3	-	-	1.06E+01	1.65E+01	5.65E+01	2.29E+01		1.47E+01	1.40E+01

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants

Table B6: 2019 Rundle Station Q1 Monitoring Results for PAHs

Contaminant	MECP Criteria (µg/m^3)	No. > Criteria	Arithmetic Mean	Minimum Q1 Concentration	Maximum Q1 Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	*12000*	0	2.01E+00	9.97E-01	5.25E+00	1.11E+00	5.25E+00	1.50E+00	6	86
2-Methylnaphthalene	*10000*	0	3.20E+00	1.40E+00	8.84E+00	1.62E+00	8.84E+00	1.93E+00	6	86
Acenaphthene	-	-	3.08E-01	1.18E-01	6.51E-01	1.24E-01	5.16E-01	6.51E-01	6	86
Acenaphthylene	*3500*	0	1.34E-01	1.03E-02	5.63E-01	8.22E-02	5.63E-01	2.77E-02	6	86
Anthracene	*200*	0	3.56E-02	9.46E-03	6.78E-02	1.84E-02	6.78E-02	4.88E-02	6	86
Benzo(a)Anthracene	-	-	1.43E-02	3.30E-03	3.32E-02	3.32E-02	2.07E-02	9.60E-03	6	86
Benzo(a)fluorene	-	-	2.63E-02	1.03E-02	6.00E-02	4.02E-02	6.00E-02	1.54E-02	6	86
Benzo(a)Pyrene	*0.05*	0	1.74E-02	2.74E-03	3.31E-02	2.81E-02	3.31E-02	1.71E-02	6	86
Benzo(b)Fluoranthene	-	-	3.53E-02	8.66E-03	9.44E-02	4.02E-02	9.44E-02	1.85E-02	6	86
Benzo(b)fluorene	-	-	1.30E-02	4.89E-03	2.43E-02	2.43E-02	2.23E-02	8.21E-03	6	86
Benzo(e)Pyrene	-	-	3.13E-02	4.49E-03	7.47E-02	4.80E-02	7.47E-02	1.68E-02	6	86
Benzo(g,h,i)Perylene	-	-	2.93E-02	8.29E-03	6.75E-02	3.41E-02	6.75E-02	1.86E-02	6	86
Benzo(k)Fluoranthene	-	-	3.57E-02	9.44E-03	1.06E-01	3.50E-02	1.06E-01	2.25E-02	6	86
Biphenyl	-	-	1.04E+00	5.82E-01	2.56E+00	8.76E-01	2.56E+00	7.41E-01	6	86
Chrysene	-	-	5.92E-02	2.03E-02	1.53E-01	8.46E-02	1.53E-01	3.18E-02	6	86
Dibenzo(a,h)Anthracene	-	-	3.20E-03	9.66E-04	7.38E-03	4.32E-03	7.38E-03	1.60E-03	6	86
Fluoranthene	-	-	2.78E-01	1.46E-01	6.38E-01	2.13E-01	6.38E-01	2.17E-01	6	86
Indeno(1,2,3-cd)Pyrene	-	-	2.37E-02	6.26E-03	5.19E-02	2.93E-02	5.19E-02	1.74E-02	6	86
Naphthalene	*22500*	0	1.27E+01	5.73E+00	3.13E+01	1.04E+01	3.13E+01	8.50E+00	6	86
o-Terphenyl	-	-	6.64E-03	2.66E-03	1.98E-02	4.74E-03	1.98E-02	4.20E-03	6	86
Perylene	-	-	4.41E-03	1.31E-03	8.44E-03	6.32E-03	8.44E-03	1.91E-03	6	86
Phenanthrene	-	-	1.04E+00	5.89E-01	2.33E+00	6.10E-01	2.33E+00	1.09E+00	6	86
Pyrene	-	-	1.70E-01	9.78E-02	3.69E-01	1.39E-01	3.69E-01	1.10E-01	6	86
Tetralin	-	-	1.33E+00	5.64E-01	3.41E+00	9.18E-01	3.41E+00	7.96E-01	6	86
Total PAH[4]	-	-	2.26E+01	1.06E+01	5.65E+01	1.65E+01	5.65E+01	1.47E+01	6	86

Table B7: Summary of Sample Flow Rate and Sample Duration for TSP and Metals

Sample Date	Courtice			Rundle		
	Filter ID	Sample Duration	Sample Volume	Filter ID	Sample Duration	Sample Volume
	No.	(min)	(m^3)	No.	(min)	(m^3)
January 3, 2019	738651	1399	1590	738634	1411	1607
January 9, 2019	738650	1386	1610	738652	1407	1667
January 15, 2019	738636	1410	1671	738635	1411	1696
January 21, 2019	739098	1405	1683	739099	1412	1686
January 27, 2019	739101	1405	1691	739100	1411	1681
February 2, 2019	739102	1403	1655	739103	1414	1682
February 8, 2019	739105	1404	1598	739104	1412	1623
February 14, 2019	739122	1394	1515	739121	1406	1582
February 20, 2019	739107	1439	1485	739106	1445	1585
February 26, 2019	Invalid Sample	Invalid Sample	Invalid Sample	Invalid Sample	Invalid Sample	Invalid Sample
March 4, 2019	739111	1407	1635	739110	1415	1607
March 10, 2019	Invalid Sample	Invalid Sample	Invalid Sample	Invalid Sample	Invalid Sample	Invalid Sample
March 16, 2019	739114	1406	1581	739115	1416	1576
March 22, 2019	739117	1402	1565	739116	1414	1563
March 28, 2019	739118	1401	1570	739120	1416	1572

Table B8: 2019 Courtice Station Q1 Monitoring Results for TSP and Metals

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	3-Jan-19	9-Jan-19	15-Jan-19	21-Jan-19	27-Jan-19	2-Feb-19	8-Feb-19	14-Feb-19
Particulate (TSP)	µg/m^3	*120*	*120*	16.2	5.6	30.0	24.2	13.0	30.7	13.5	13.2
Total Mercury (Hg)	µg/m^3	*2*	*2*	1.25E-05	1.57E-06	1.50E-06	1.02E-05	1.12E-05	1.74E-05	2.31E-05	1.65E-06
Aluminum (Al)	µg/m^3	*4.8*	-	1.03E-01	6.73E-02	1.24E-01	2.97E-01	8.16E-02	7.61E-02	1.12E-01	6.34E-02
Antimony (Sb)	µg/m^3	*25*	*25*	5.41E-04	3.08E-04	1.02E-03	3.39E-04	7.87E-04	1.54E-03	1.13E-03	4.16E-04
Arsenic (As)	µg/m^3	*0.3*	*0.3*	9.43E-04	9.43E-04	8.98E-04	8.91E-04	8.87E-04	9.06E-04	9.39E-04	9.90E-04
Barium (Ba)	µg/m^3	*10*	*10*	3.96E-03	3.65E-03	6.82E-03	4.75E-03	2.07E-03	1.06E-02	2.69E-03	2.24E-03
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	3.14E-05	3.14E-05	2.99E-05	2.97E-05	2.96E-05	3.02E-05	3.13E-05	3.30E-05
Bismuth (Bi)	µg/m^3	-	-	5.66E-04	5.66E-04	5.39E-04	5.35E-04	5.32E-04	5.44E-04	5.63E-04	5.94E-04
Boron (B)	µg/m^3	*120*	-	1.26E-02	1.26E-02	1.20E-02	1.19E-02	1.18E-02	1.21E-02	1.25E-02	1.32E-02
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	6.29E-04	6.29E-04	5.98E-04	5.94E-04	5.91E-04	6.04E-04	6.26E-04	6.60E-04
Chromium (Cr)	µg/m^3	*0.5*	-	1.57E-03	1.57E-03	4.49E-03	3.15E-03	3.61E-03	4.17E-03	1.56E-03	1.65E-03
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	6.29E-04	6.29E-04	5.98E-04	5.94E-04	5.91E-04	6.04E-04	6.26E-04	6.60E-04
Copper (Cu)	µg/m^3	*50*	-	5.49E-02	2.04E-02	1.49E-02	8.67E-03	1.56E-02	6.10E-02	4.05E-02	1.91E-02
Iron (Fe)	µg/m^3	*4*	-	2.62E-01	1.80E-01	3.34E-01	4.04E-01	1.50E-01	2.80E-01	2.31E-01	1.87E-01
Lead (Pb)	µg/m^3	*0.5*	*0.5*	3.33E-03	9.43E-04	3.29E-03	8.91E-04	2.90E-03	4.17E-03	3.07E-03	2.24E-03
Magnesium (Mg)	µg/m^3	-	-	1.64E-01	1.01E-01	2.63E-01	1.78E-01	7.69E-02	1.27E-01	1.50E-01	3.30E-02
Manganese (Mn)	µg/m^3	*0.4*	-	1.08E-02	4.34E-03	1.44E-02	1.22E-02	5.44E-03	7.19E-03	9.95E-03	7.99E-03
Molybdenum (Mo)	µg/m^3	*120*	-	2.20E-03	3.14E-04	2.99E-04	2.97E-04	6.51E-04	1.51E-03	1.19E-03	3.30E-04
Nickel (Ni)	µg/m^3	*0.2*	-	9.43E-04	9.43E-04	8.98E-04	8.91E-04	8.87E-04	9.06E-04	9.39E-04	9.90E-04
Phosphorus (P)	µg/m^3	-	-	2.36E-01	2.36E-01	2.24E-01	2.23E-01	2.22E-01	2.27E-01	2.35E-01	2.47E-01
Selenium (Se)	µg/m^3	*10*	*10*	3.14E-03	3.14E-03	2.99E-03	2.97E-03	2.96E-03	3.02E-03	3.13E-03	3.30E-03
Silver (Ag)	µg/m^3	*1*	*1*	3.14E-04	3.14E-04	2.99E-04	2.97E-04	2.96E-04	3.02E-04	3.13E-04	3.30E-04
Strontium (Sr)	µg/m^3	*120*	-	3.08E-03	2.08E-03	4.85E-03	2.50E-03	8.87E-04	2.42E-03	9.39E-04	9.90E-04
Thallium (Tl)	µg/m^3	-	-	2.83E-05	2.83E-05	2.69E-05	2.67E-05	2.66E-05	2.72E-05	2.82E-05	2.97E-05
Tin (Sn)	µg/m^3	*10*	*10*	2.52E-03	3.14E-04	2.21E-03	2.97E-04	8.87E-04	1.51E-03	8.76E-04	1.06E-03
Titanium (Ti)	µg/m^3	*120*	-	3.46E-03	3.46E-03	3.29E-03	1.31E-02	3.25E-03	3.32E-03	3.44E-03	3.63E-03
Uranium (Ur)	µg/m^3	*1.5*	-	3.14E-05	3.14E-05	2.99E-05	2.97E-05	2.96E-05	3.02E-05	3.13E-05	3.30E-05
Vanadium (V)	µg/m^3	*2*	*1*	1.57E-03	1.57E-03	1.50E-03	1.49E-03	1.48E-03	1.51E-03	1.56E-03	1.65E-03
Zinc (Zn)	µg/m^3	*120*	-	6.79E-02	4.56E-02	6.28E-02	2.67E-02	7.69E-02	4.65E-02	1.66E-01	3.27E-02
Zirconium (Zr)	µg/m^3	*20*	-	6.29E-04	6.29E-04	5.98E-04	5.94E-04	5.91E-04	6.04E-04	6.26E-04	6.60E-04

NOTE: All non-detectable results were reported as 1/2 of the detection limit

Table B8: 2019 Courtice Station Q1 Monitoring Results for TSP and Metals

Contaminant	20-Feb-19	26-Feb-19	4-Mar-19	10-Mar-19	16-Mar-19	22-Mar-19	28-Mar-19	MECP Criteria (µg/m^3)	No. > Criteria	Geometric Mean	Arithmetic Mean
Particulate (TSP)	17.9	Invalid Sample	6.5	Invalid Sample	7.3	15.5	27.6	*120*	0	14.9	17.0
Total Mercury (Hg)	1.74E-06		6.06E-06		3.42E-06	1.96E-05	1.03E-05	*2*	0	6.09E-06	9.24E-06
Aluminum (Al)	9.10E-02		4.10E-02		6.01E-02	1.17E-01	1.83E-01	*4.8*	0	9.54E-02	1.09E-01
Antimony (Sb)	5.07E-04		6.36E-04		3.10E-04	5.94E-04	1.22E-03	*25*	0	6.28E-04	7.18E-04
Arsenic (As)	1.04E-03		9.17E-04		9.49E-04	9.58E-04	9.55E-04	*0.3*	0	9.39E-04	9.40E-04
Barium (Ba)	3.61E-03		3.91E-03		2.91E-03	5.30E-03	8.85E-03	*10*	0	4.18E-03	4.72E-03
Beryllium (Be)	3.48E-05		3.06E-05		3.16E-05	3.19E-05	3.18E-05	*0.01*	0	3.13E-05	3.13E-05
Bismuth (Bi)	6.26E-04		5.50E-04		5.69E-04	5.75E-04	5.73E-04	-	-	5.63E-04	5.64E-04
Boron (B)	1.39E-02		1.22E-02		1.27E-02	1.28E-02	1.27E-02	*120*	0	1.25E-02	1.25E-02
Cadmium (Cd)	6.95E-04		6.12E-04		6.33E-04	6.39E-04	6.37E-04	*0.025*	0	6.26E-04	6.27E-04
Chromium (Cr)	6.26E-03		3.91E-03		3.67E-03	4.79E-03	5.48E-03	*0.5*	0	3.17E-03	3.53E-03
Cobalt (Co)	6.95E-04		6.12E-04		6.33E-04	6.39E-04	6.37E-04	*0.1*	0	6.26E-04	6.27E-04
Copper (Cu)	2.56E-02		6.61E-03		1.08E-02	1.38E-02	1.80E-02	*50*	0	1.92E-02	2.38E-02
Iron (Fe)	1.99E-01		1.78E-01		1.68E-01	3.42E-01	4.90E-01	*4*	0	2.45E-01	2.62E-01
Lead (Pb)	2.22E-03		9.17E-04		9.49E-04	9.58E-04	4.01E-03	*2*	0	1.95E-03	2.30E-03
Magnesium (Mg)	1.32E-01		1.10E-01		8.86E-02	1.47E-01	2.61E-01	-	-	1.25E-01	1.41E-01
Manganese (Mn)	5.21E-03		5.50E-03		4.11E-03	9.07E-03	1.67E-02	*0.4*	0	7.88E-03	8.68E-03
Molybdenum (Mo)	7.65E-04		3.06E-04		3.16E-04	3.19E-04	1.40E-03	*120*	0	5.77E-04	7.61E-04
Nickel (Ni)	1.04E-03		9.17E-04		9.49E-04	9.58E-04	2.87E-03	*0.2*	0	1.02E-03	1.09E-03
Phosphorus (P)	2.61E-01		2.29E-01		2.37E-01	2.40E-01	2.39E-01	-	-	2.35E-01	2.35E-01
Selenium (Se)	3.48E-03		3.06E-03		3.16E-03	3.19E-03	3.18E-03	*10*	0	3.13E-03	3.13E-03
Silver (Ag)	3.48E-04		3.06E-04		3.16E-04	3.19E-04	3.18E-04	*1*	0	3.13E-04	3.13E-04
Strontium (Sr)	3.41E-03		2.26E-03		2.34E-03	4.54E-03	5.73E-03	*120*	0	2.36E-03	2.77E-03
Thallium (Tl)	3.13E-05		2.75E-05		2.85E-05	2.88E-05	9.81E-05	-	-	3.10E-05	3.35E-05
Tin (Sn)	9.04E-04		6.12E-04		3.16E-04	3.19E-04	1.34E-03	*10*	0	7.92E-04	1.01E-03
Titanium (Ti)	3.82E-03		3.36E-03		3.48E-03	3.51E-03	7.64E-03	*120*	0	4.07E-03	4.52E-03
Uranium (Ur)	3.48E-05		3.06E-05		3.16E-05	3.19E-05	3.18E-05	*1.5*	0	3.13E-05	3.13E-05
Vanadium (V)	1.74E-03		1.53E-03		1.58E-03	1.60E-03	3.63E-03	*2*	0	1.67E-03	1.72E-03
Zinc (Zn)	4.00E-02		2.02E-02		2.08E-02	2.01E-02	3.67E-02	*120*	0	4.20E-02	5.10E-02
Zirconium (Zr)	6.95E-04		6.12E-04		6.33E-04	6.39E-04	6.37E-04	*20*	0	6.26E-04	6.27E-04

Table B8: 2019 Courtice Station Q1 Monitoring Results for TSP and Metals

Contaminant	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	5.6	30.7	30.0	30.7	27.6	13	87
Total Mercury (Hg)	1.50E-06	2.31E-05	1.25E-05	2.31E-05	1.96E-05	13	87
Aluminum (Al)	4.10E-02	2.97E-01	2.97E-01	1.12E-01	1.83E-01	13	87
Antimony (Sb)	3.08E-04	1.54E-03	1.02E-03	1.54E-03	1.22E-03	13	87
Arsenic (As)	8.87E-04	1.04E-03	9.43E-04	1.04E-03	9.58E-04	13	87
Barium (Ba)	2.07E-03	1.06E-02	6.82E-03	1.06E-02	8.85E-03	13	87
Beryllium (Be)	2.96E-05	3.48E-05	3.14E-05	3.48E-05	3.19E-05	13	87
Bismuth (Bi)	5.32E-04	6.26E-04	5.66E-04	6.26E-04	5.75E-04	13	87
Boron (B)	1.18E-02	1.39E-02	1.26E-02	1.39E-02	1.28E-02	13	87
Cadmium (Cd)	5.91E-04	6.95E-04	6.29E-04	6.95E-04	6.39E-04	13	87
Chromium (Cr)	1.56E-03	6.26E-03	4.49E-03	6.26E-03	5.48E-03	13	87
Cobalt (Co)	5.91E-04	6.95E-04	6.29E-04	6.95E-04	6.39E-04	13	87
Copper (Cu)	6.61E-03	6.10E-02	5.49E-02	6.10E-02	1.80E-02	13	87
Iron (Fe)	1.50E-01	4.90E-01	4.04E-01	2.80E-01	4.90E-01	13	87
Lead (Pb)	8.91E-04	4.17E-03	3.33E-03	4.17E-03	4.01E-03	13	87
Magnesium (Mg)	3.30E-02	2.63E-01	2.63E-01	1.50E-01	2.61E-01	13	87
Manganese (Mn)	4.11E-03	1.67E-02	1.44E-02	9.95E-03	1.67E-02	13	87
Molybdenum (Mo)	2.97E-04	2.20E-03	2.20E-03	1.51E-03	1.40E-03	13	87
Nickel (Ni)	8.87E-04	2.87E-03	9.43E-04	1.04E-03	2.87E-03	13	87
Phosphorus (P)	2.22E-01	2.61E-01	2.36E-01	2.61E-01	2.40E-01	13	87
Selenium (Se)	2.96E-03	3.48E-03	3.14E-03	3.48E-03	3.19E-03	13	87
Silver (Ag)	2.96E-04	3.48E-04	3.14E-04	3.48E-04	3.19E-04	13	87
Strontium (Sr)	8.87E-04	5.73E-03	4.85E-03	3.41E-03	5.73E-03	13	87
Thallium (Tl)	2.66E-05	9.81E-05	2.83E-05	3.13E-05	9.81E-05	13	87
Tin (Sn)	2.97E-04	2.52E-03	2.52E-03	1.51E-03	1.34E-03	13	87
Titanium (Ti)	3.25E-03	1.31E-02	1.31E-02	3.82E-03	7.64E-03	13	87
Uranium (Ur)	2.96E-05	3.48E-05	3.14E-05	3.48E-05	3.19E-05	13	87
Vanadium (V)	1.48E-03	3.63E-03	1.57E-03	1.74E-03	3.63E-03	13	87
Zinc (Zn)	2.01E-02	1.66E-01	7.69E-02	1.66E-01	3.67E-02	13	87
Zirconium (Zr)	5.91E-04	6.95E-04	6.29E-04	6.95E-04	6.39E-04	13	87

Table B9: 2019 Rundle Station Q1 Monitoring Results for TSP and Metals

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	3-Jan-19	9-Jan-19	15-Jan-19	21-Jan-19	27-Jan-19	2-Feb-19	8-Feb-19	14-Feb-19
Particulate (TSP)	µg/m^3	*120*	*120*	18.8	6.6	43.6	21.1	17.5	30.7	14.0	12.1
Total Mercury (Hg)	µg/m^3	*2*	*2*	7.84E-06	1.50E-06	1.47E-06	1.48E-06	1.49E-06	1.71E-05	1.54E-06	1.58E-06
Aluminum (Al)	µg/m^3	*4.8*	-	1.01E-01	6.24E-02	1.90E-01	2.99E-01	1.07E-01	8.92E-02	4.25E-01	6.26E-02
Antimony (Sb)	µg/m^3	*25*	*25*	6.41E-04	1.62E-04	7.66E-04	7.41E-05	2.86E-04	1.46E-03	2.77E-04	2.91E-04
Arsenic (As)	µg/m^3	*0.3*	*0.3*	9.33E-04	9.00E-04	8.84E-04	8.90E-04	8.92E-04	8.92E-04	9.24E-04	9.48E-04
Barium (Ba)	µg/m^3	*10*	*10*	5.35E-03	1.62E-03	8.55E-03	2.55E-03	2.44E-03	1.15E-02	5.36E-03	3.92E-03
Beryllium (Be)	µg/m^3	*0.01*	*0.01*	3.11E-05	3.00E-05	2.95E-05	2.97E-05	2.97E-05	2.97E-05	3.08E-05	3.16E-05
Bismuth (Bi)	µg/m^3	-	-	5.60E-04	5.40E-04	5.31E-04	5.34E-04	5.35E-04	5.35E-04	5.55E-04	5.69E-04
Boron (B)	µg/m^3	*120*	-	1.24E-02	1.20E-02	1.18E-02	1.19E-02	1.19E-02	1.19E-02	1.23E-02	1.26E-02
Cadmium (Cd)	µg/m^3	*0.025*	*0.025*	6.22E-04	6.00E-04	5.90E-04	5.93E-04	5.95E-04	5.95E-04	6.16E-04	6.32E-04
Chromium (Cr)	µg/m^3	*0.5*	-	1.56E-03	1.50E-03	3.77E-03	2.97E-03	4.05E-03	5.05E-03	3.39E-03	1.58E-03
Cobalt (Co)	µg/m^3	*0.1*	*0.1*	6.22E-04	6.00E-04	5.90E-04	5.93E-04	5.95E-04	5.95E-04	6.16E-04	6.32E-04
Copper (Cu)	µg/m^3	*50*	-	1.16E-02	1.37E-02	1.75E-02	1.35E-02	1.93E-02	4.47E-02	1.08E-02	2.05E-02
Iron (Fe)	µg/m^3	*4*	-	3.22E-01	1.14E-01	5.12E-01	3.66E-01	1.90E-01	2.78E-01	5.77E-01	1.43E-01
Lead (Pb)	µg/m^3	*0.5*	*0.5*	2.36E-03	9.00E-04	2.95E-03	8.90E-04	2.68E-03	5.11E-03	2.77E-03	9.48E-04
Magnesium (Mg)	µg/m^3	-	-	1.68E-01	6.60E-02	3.60E-01	1.42E-01	1.25E-01	1.43E-01	4.25E-01	3.16E-02
Manganese (Mn)	µg/m^3	*0.4*	-	8.71E-03	3.00E-03	1.97E-02	1.23E-02	6.96E-03	8.92E-03	2.32E-02	3.98E-03
Molybdenum (Mo)	µg/m^3	*120*	-	3.11E-04	3.00E-04	2.95E-04	2.97E-04	2.97E-04	2.20E-03	3.08E-04	8.22E-04
Nickel (Ni)	µg/m^3	*0.2*	-	9.33E-04	9.00E-04	8.84E-04	8.90E-04	8.92E-04	8.92E-04	9.24E-04	9.48E-04
Phosphorus (P)	µg/m^3	-	-	2.33E-01	2.25E-01	2.21E-01	2.22E-01	2.23E-01	2.23E-01	2.31E-01	2.37E-01
Selenium (Se)	µg/m^3	*10*	*10*	3.11E-03	3.00E-03	2.95E-03	2.97E-03	2.97E-03	2.97E-03	3.08E-03	3.16E-03
Silver (Ag)	µg/m^3	*1*	*1*	3.11E-04	3.00E-04	2.95E-04	2.97E-04	2.97E-04	2.97E-04	3.08E-04	3.16E-04
Strontium (Sr)	µg/m^3	*120*	-	4.48E-03	9.00E-04	8.37E-03	1.96E-03	2.20E-03	2.68E-03	5.67E-03	9.48E-04
Thallium (Tl)	µg/m^3	-	-	2.80E-05	2.70E-05	2.65E-05	2.67E-05	2.68E-05	2.68E-05	2.77E-05	2.84E-05
Tin (Sn)	µg/m^3	*10*	*10*	8.09E-04	1.02E-03	1.95E-03	1.07E-03	2.97E-04	1.61E-03	1.23E-03	3.16E-04
Titanium (Ti)	µg/m^3	*120*	-	3.42E-03	3.30E-03	8.84E-03	1.25E-02	3.27E-03	3.27E-03	8.63E-03	3.48E-03
Uranium (Ur)	µg/m^3	*1.5*	-	3.11E-05	3.00E-05	2.95E-05	2.97E-05	2.97E-05	2.97E-05	3.08E-05	3.16E-05
Vanadium (V)	µg/m^3	*2*	*1*	1.56E-03	1.50E-03	1.47E-03	1.48E-03	1.49E-03	1.49E-03	1.54E-03	1.58E-03
Zinc (Zn)	µg/m^3	*120*	-	3.06E-02	1.98E-02	4.62E-02	1.91E-02	5.87E-02	4.92E-02	3.64E-02	2.30E-02
Zirconium (Zr)	µg/m^3	*20*	-	6.22E-04	6.00E-04	5.90E-04	5.93E-04	5.95E-04	5.95E-04	6.16E-04	6.32E-04

NOTE: All non-detectable results were reported as 1/2 of the detection limit

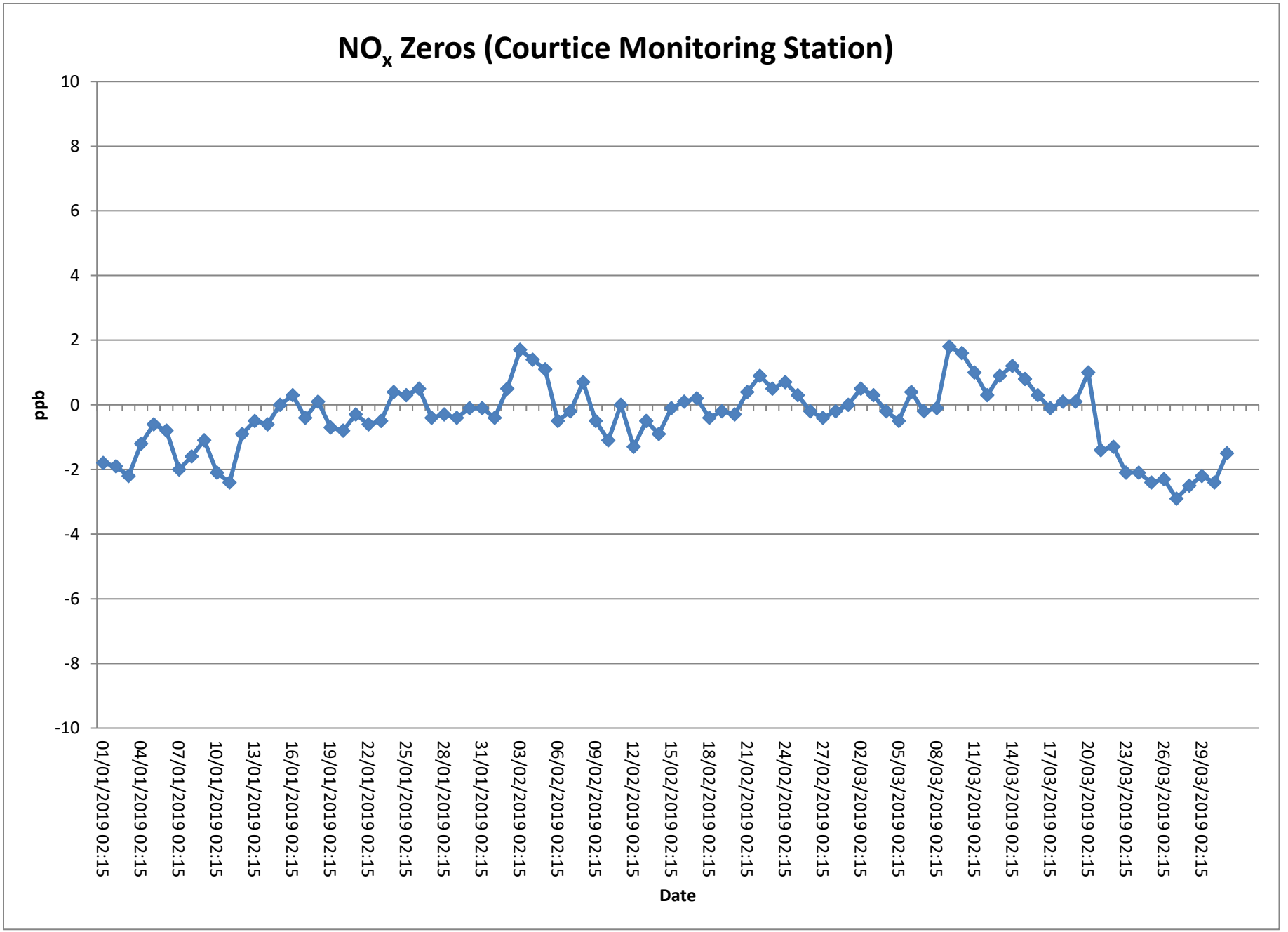
Table B9: 2019 Rundle Station Q1 Monitoring Results for TSP and Metals

Contaminant	20-Feb-19	26-Feb-19	4-Mar-19	10-Mar-19	16-Mar-19	22-Mar-19	28-Mar-19	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Geometric Mean
Particulate (TSP)	20.8	Invalid Sample	15.6	Invalid Sample	9.9	19.8	32.4	*120*	0	18.1
Total Mercury (Hg)	1.58E-06		5.60E-06		1.20E-05	1.32E-05	1.03E-05	*2*	0	3.68E-06
Aluminum (Al)	1.12E-01		4.79E-02		6.85E-02	1.44E-01	2.64E-01	*4.8*	0	1.22E-01
Antimony (Sb)	3.97E-04		2.61E-04		7.93E-05	2.69E-04	1.23E-03	*25*	0	3.29E-04
Arsenic (As)	9.46E-04		9.33E-04		9.52E-04	9.60E-04	9.54E-04	*0.3*	0	9.23E-04
Barium (Ba)	5.11E-03		3.05E-03		2.54E-03	2.62E-03	1.20E-02	*10*	0	4.23E-03
Beryllium (Be)	3.15E-05		3.11E-05		3.17E-05	3.20E-05	3.18E-05	*0.01*	0	3.08E-05
Bismuth (Bi)	5.68E-04		5.60E-04		5.71E-04	5.76E-04	5.73E-04	-	-	5.54E-04
Boron (B)	1.26E-02		1.24E-02		1.27E-02	1.28E-02	1.27E-02	*120*	0	1.23E-02
Cadmium (Cd)	6.31E-04		6.22E-04		6.35E-04	6.40E-04	6.36E-04	*0.025*	0	6.16E-04
Chromium (Cr)	5.49E-03		3.80E-03		4.19E-03	3.97E-03	6.30E-03	*0.5*	0	3.33E-03
Cobalt (Co)	6.31E-04		6.22E-04		6.35E-04	6.40E-04	6.36E-04	*0.1*	0	6.16E-04
Copper (Cu)	2.07E-02		8.96E-03		8.38E-03	1.94E-02	1.73E-02	*50*	0	1.58E-02
Iron (Fe)	2.33E-01		1.42E-01		1.46E-01	2.32E-01	5.78E-01	*4*	0	2.55E-01
Lead (Pb)	1.89E-03		9.33E-04		9.52E-04	9.60E-04	4.07E-03	*2*	0	1.74E-03
Magnesium (Mg)	1.58E-01		1.24E-01		1.02E-01	1.15E-01	3.12E-01	-	-	1.42E-01
Manganese (Mn)	6.94E-03		4.60E-03		4.00E-03	2.31E-02	1.84E-02	*0.4*	0	8.82E-03
Molybdenum (Mo)	3.15E-04		3.11E-04		3.17E-04	3.20E-04	1.27E-03	*120*	0	4.30E-04
Nickel (Ni)	9.46E-04		9.33E-04		9.52E-04	9.60E-04	2.42E-03	*0.2*	0	9.92E-04
Phosphorus (P)	2.37E-01		2.33E-01		2.38E-01	2.40E-01	2.39E-01	-	-	2.31E-01
Selenium (Se)	3.15E-03		3.11E-03		3.17E-03	3.20E-03	3.18E-03	*10*	0	3.08E-03
Silver (Ag)	3.15E-04		3.11E-04		3.17E-04	3.20E-04	3.18E-04	*1*	0	3.08E-04
Strontium (Sr)	4.67E-03		3.55E-03		3.05E-03	3.39E-03	9.35E-03	*120*	0	3.18E-03
Thallium (Tl)	2.84E-05		2.80E-05		2.86E-05	2.88E-05	6.36E-05	-	-	2.95E-05
Tin (Sn)	8.83E-04		3.11E-04		3.17E-04	3.20E-04	1.21E-03	*10*	0	7.06E-04
Titanium (Ti)	3.47E-03		3.42E-03		3.49E-03	3.52E-03	1.02E-02	*120*	0	4.73E-03
Uranium (Ur)	3.15E-05		3.11E-05		3.17E-05	3.20E-05	3.18E-05	*1.5*	0	3.08E-05
Vanadium (V)	1.58E-03		1.56E-03		1.59E-03	1.60E-03	4.07E-03	*2*	0	1.65E-03
Zinc (Zn)	2.95E-02		1.55E-02		1.63E-02	1.25E-02	3.70E-02	*120*	0	2.72E-02
Zirconium (Zr)	6.31E-04		6.22E-04		6.35E-04	6.40E-04	6.36E-04	*20*	0	6.16E-04

Table B9: 2019 Rundle Station Q1 Monitoring Results for TSP and Metals

Contaminant	Arithmetic Mean	Q1 Minimum Concentration	Q1 Maximum Concentration	January Maximum Concentration	February Maximum Concentration	March Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	20.2	6.6	43.6	43.6	30.7	32.4	13	87
Total Mercury (Hg)	5.90E-06	1.47E-06	1.71E-05	7.84E-06	1.71E-05	1.32E-05	13	87
Aluminum (Al)	1.52E-01	4.79E-02	4.25E-01	2.99E-01	4.25E-01	2.64E-01	13	87
Antimony (Sb)	4.76E-04	7.41E-05	1.46E-03	7.66E-04	1.46E-03	1.23E-03	13	87
Arsenic (As)	9.24E-04	8.84E-04	9.60E-04	9.33E-04	9.48E-04	9.60E-04	13	87
Barium (Ba)	5.12E-03	1.62E-03	1.20E-02	8.55E-03	1.15E-02	1.20E-02	13	87
Beryllium (Be)	3.08E-05	2.95E-05	3.20E-05	3.11E-05	3.16E-05	3.20E-05	13	87
Bismuth (Bi)	5.54E-04	5.31E-04	5.76E-04	5.60E-04	5.69E-04	5.76E-04	13	87
Boron (B)	1.23E-02	1.18E-02	1.28E-02	1.24E-02	1.26E-02	1.28E-02	13	87
Cadmium (Cd)	6.16E-04	5.90E-04	6.40E-04	6.22E-04	6.32E-04	6.40E-04	13	87
Chromium (Cr)	3.66E-03	1.50E-03	6.30E-03	4.05E-03	5.49E-03	6.30E-03	13	87
Cobalt (Co)	6.16E-04	5.90E-04	6.40E-04	6.22E-04	6.32E-04	6.40E-04	13	87
Copper (Cu)	1.74E-02	8.38E-03	4.47E-02	1.93E-02	4.47E-02	1.94E-02	13	87
Iron (Fe)	2.95E-01	1.14E-01	5.78E-01	5.12E-01	5.77E-01	5.78E-01	13	87
Lead (Pb)	2.11E-03	8.90E-04	5.11E-03	2.95E-03	5.11E-03	4.07E-03	13	87
Magnesium (Mg)	1.75E-01	3.16E-02	4.25E-01	3.60E-01	4.25E-01	3.12E-01	13	87
Manganese (Mn)	1.11E-02	3.00E-03	2.32E-02	1.97E-02	2.32E-02	2.31E-02	13	87
Molybdenum (Mo)	5.67E-04	2.95E-04	2.20E-03	3.11E-04	2.20E-03	1.27E-03	13	87
Nickel (Ni)	1.04E-03	8.84E-04	2.42E-03	9.33E-04	9.48E-04	2.42E-03	13	87
Phosphorus (P)	2.31E-01	2.21E-01	2.40E-01	2.33E-01	2.37E-01	2.40E-01	13	87
Selenium (Se)	3.08E-03	2.95E-03	3.20E-03	3.11E-03	3.16E-03	3.20E-03	13	87
Silver (Ag)	3.08E-04	2.95E-04	3.20E-04	3.11E-04	3.16E-04	3.20E-04	13	87
Strontium (Sr)	3.94E-03	9.00E-04	9.35E-03	8.37E-03	5.67E-03	9.35E-03	13	87
Thallium (Tl)	3.04E-05	2.65E-05	6.36E-05	2.80E-05	2.84E-05	6.36E-05	13	87
Tin (Sn)	8.72E-04	2.97E-04	1.95E-03	1.95E-03	1.61E-03	1.21E-03	13	87
Titanium (Ti)	5.44E-03	3.27E-03	1.25E-02	1.25E-02	8.63E-03	1.02E-02	13	87
Uranium (Ur)	3.08E-05	2.95E-05	3.20E-05	3.11E-05	3.16E-05	3.20E-05	13	87
Vanadium (V)	1.73E-03	1.47E-03	4.07E-03	1.56E-03	1.58E-03	4.07E-03	13	87
Zinc (Zn)	3.03E-02	1.25E-02	5.87E-02	5.87E-02	4.92E-02	3.70E-02	13	87
Zirconium (Zr)	6.16E-04	5.90E-04	6.40E-04	6.22E-04	6.32E-04	6.40E-04	13	87

APPENDIX C


NOx Zeros (Courtice Monitoring Station)
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8
6
4
2
0
-2
-4
-6
-8
-10
ppb
01/01/2019 02:15
04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
16/01/2019 02:15
19/01/2019 02:15
22/01/2019 02:15
25/01/2019 02:15
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31/01/2019 02:15
03/02/2019 02:15
06/02/2019 02:15
09/02/2019 02:15
12/02/2019 02:15
15/02/2019 02:15
18/02/2019 02:15
21/02/2019 02:15
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02/03/2019 02:15
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14/03/2019 02:15
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20/03/2019 02:15
23/03/2019 02:15
26/03/2019 02:15
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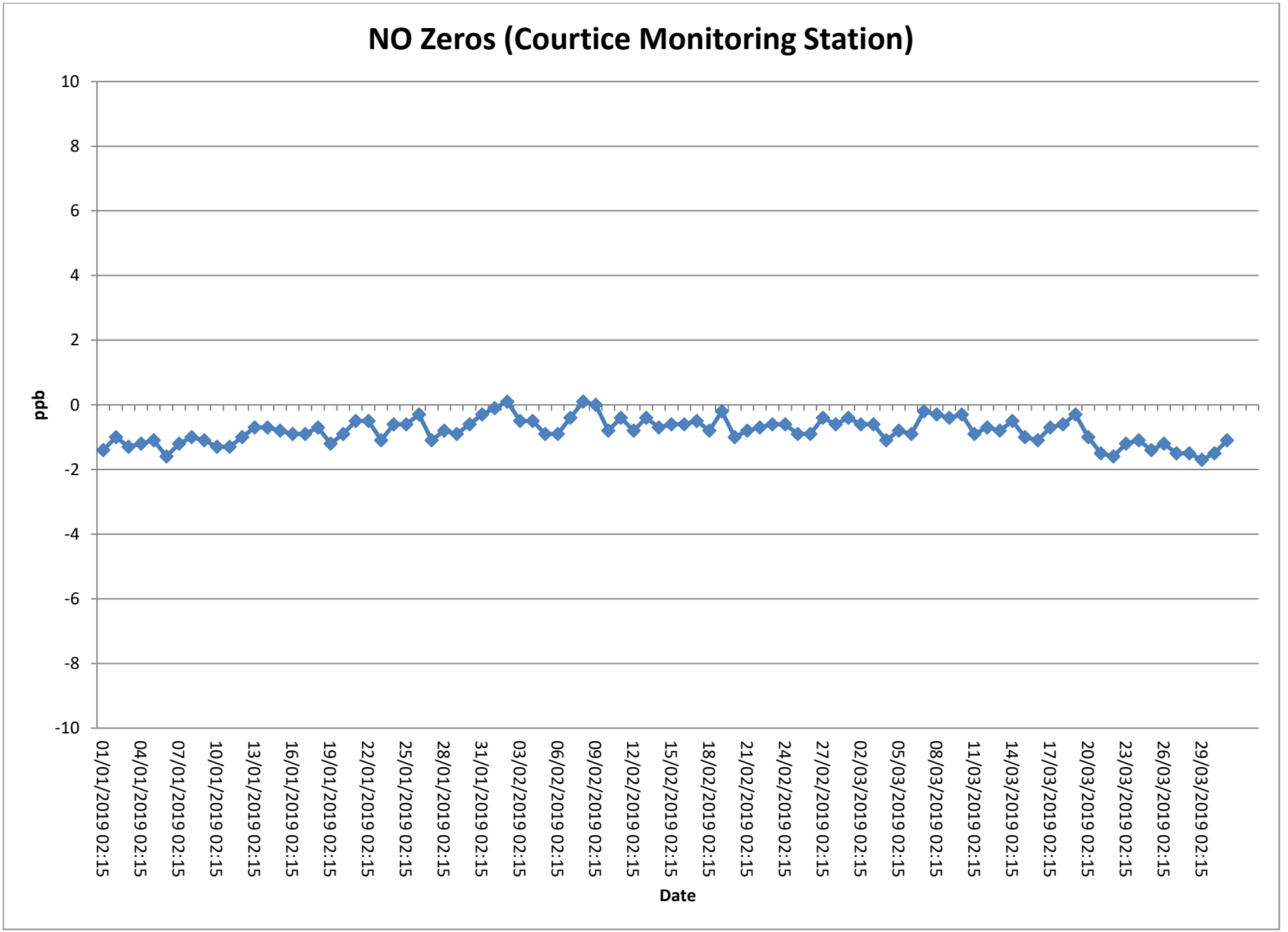
Date


NO Zeros (Courtice Monitoring Station)
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8
6
4
2
0
-2
-4
-6
-8
-10
ppb
01/01/2019 02:15
04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
16/01/2019 02:15
19/01/2019 02:15
22/01/2019 02:15
25/01/2019 02:15
28/01/2019 02:15
31/01/2019 02:15
03/02/2019 02:15
06/02/2019 02:15
09/02/2019 02:15
12/02/2019 02:15
15/02/2019 02:15
18/02/2019 02:15
21/02/2019 02:15
24/02/2019 02:15
27/02/2019 02:15
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14/03/2019 02:15
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26/03/2019 02:15
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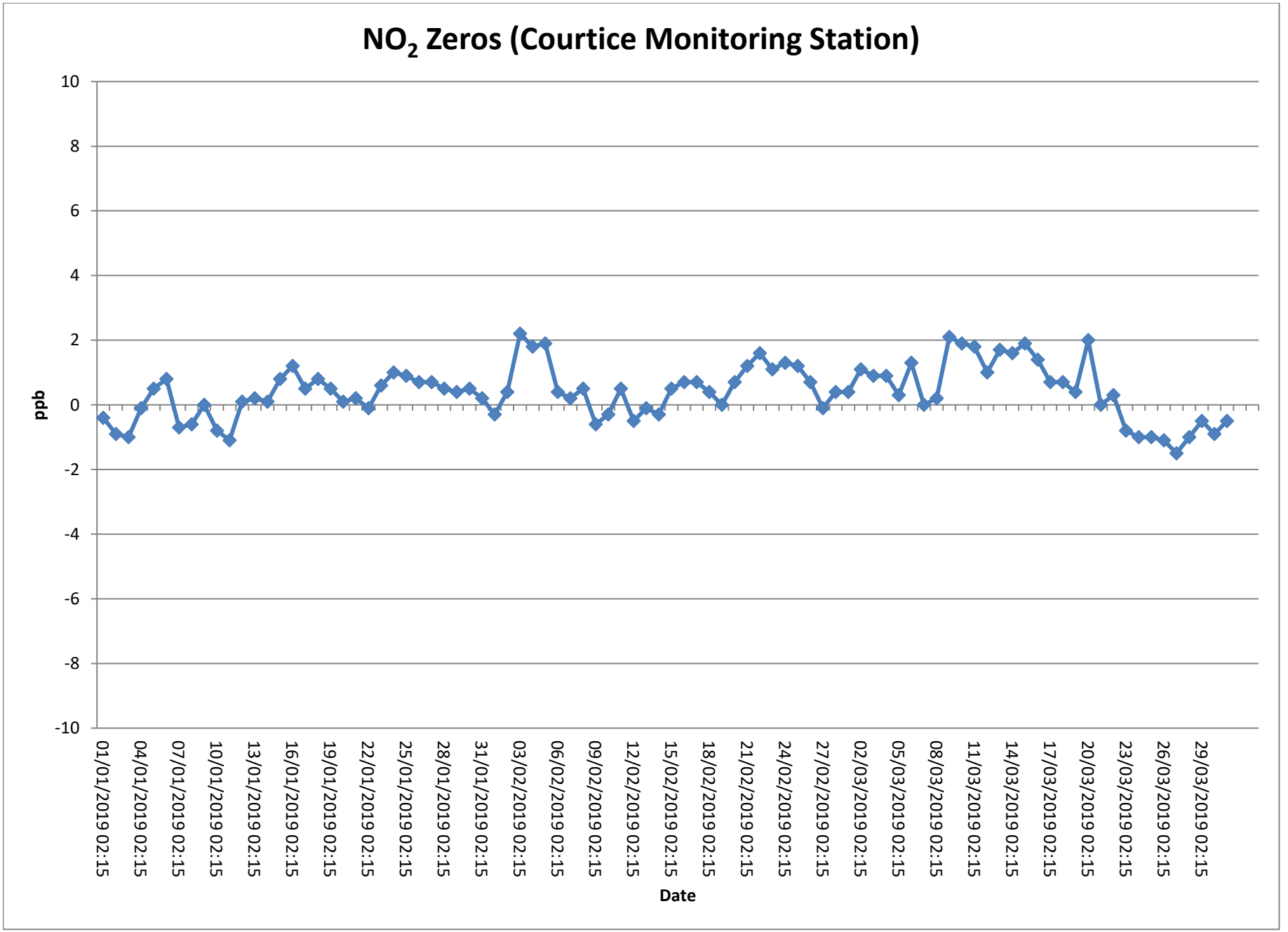
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8
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2
0
-2
-4
-6
-8
-10
ppb
01/01/2019 02:15
04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
16/01/2019 02:15
19/01/2019 02:15
22/01/2019 02:15
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31/01/2019 02:15
03/02/2019 02:15
06/02/2019 02:15
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14/03/2019 02:15
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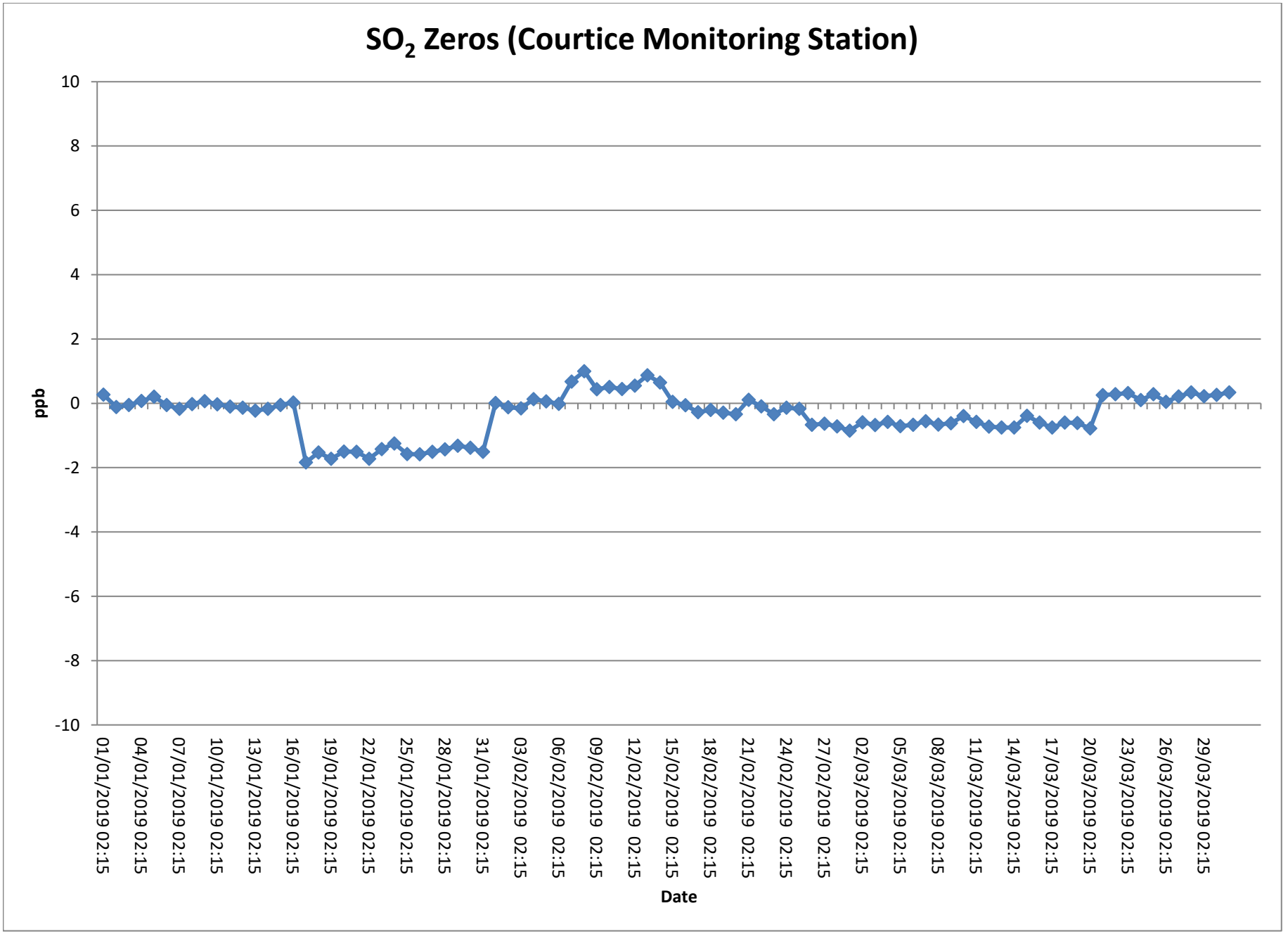
23/03/2019 02:15
26/03/2019 02:15
29/03/2019 02:15
Date


SO2 Zeros (Courtice Monitoring Station)
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4
2
0
-2
-4
-6
-8
-10
ppb
01/01/2019 02:15
04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
16/01/2019 02:15
19/01/2019 02:15
22/01/2019 02:15
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21/02/2019 02:15
24/02/2019 02:15
27/02/2019 02:15
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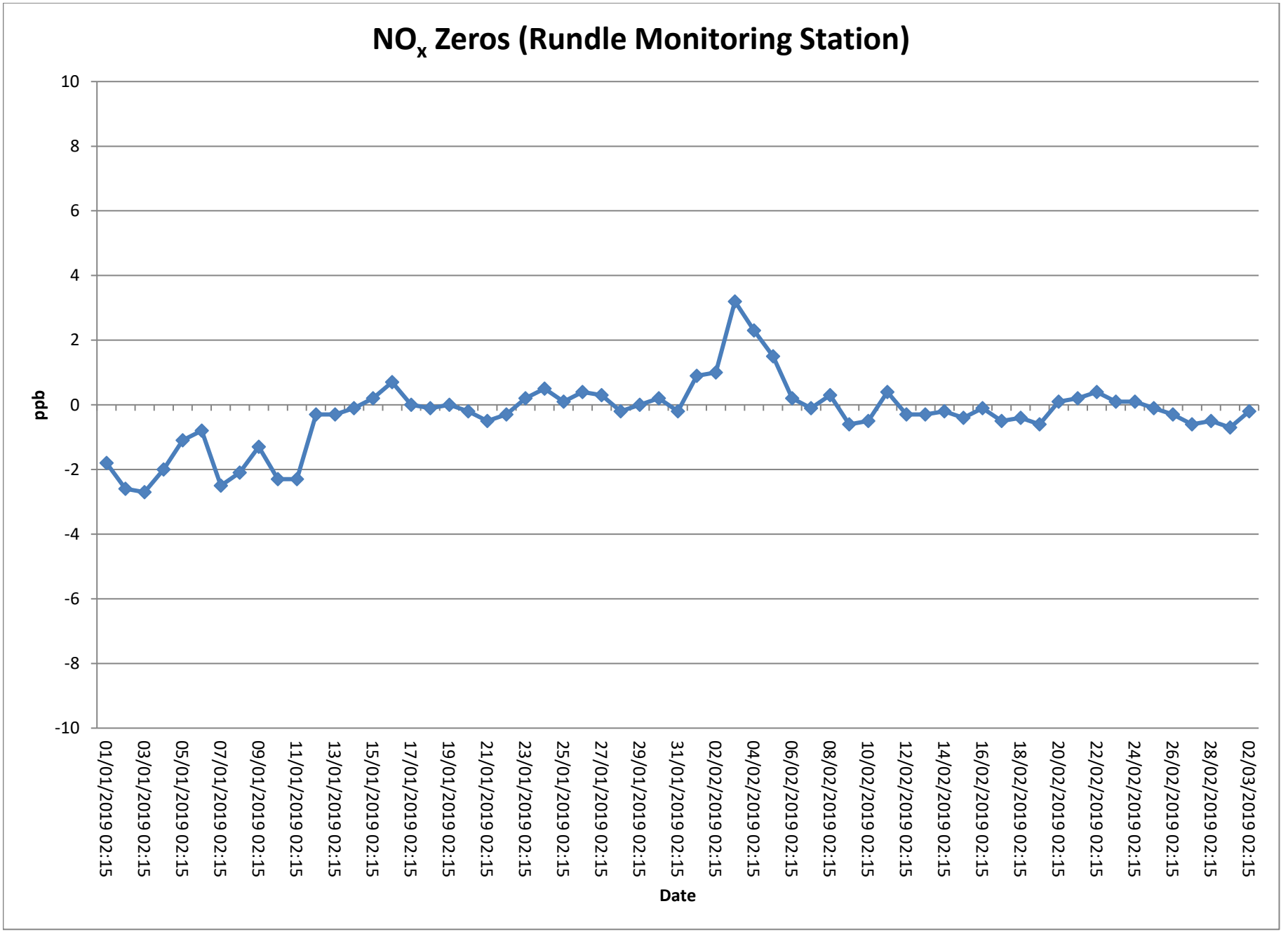
05/03/2019 02:15
08/03/2019 02:15
11/03/2019 02:15
14/03/2019 02:15
17/03/2019 02:15
20/03/2019 02:15
23/03/2019 02:15
26/03/2019 02:15
29/03/2019 02:15
Date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4
2
0
-2
-4
-6
-8
-10
01/01/2019 02:15
03/01/2019 02:15
05/01/2019 02:15
07/01/2019 02:15
09/01/2019 02:15
11/01/2019 02:15
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15/01/2019 02:15
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02/02/2019 02:15
04/02/2019 02:15
06/02/2019 02:15
08/02/2019 02:15
10/02/2019 02:15
12/02/2019 02:15
14/02/2019 02:15
16/02/2019 02:15
18/02/2019 02:15
20/02/2019 02:15
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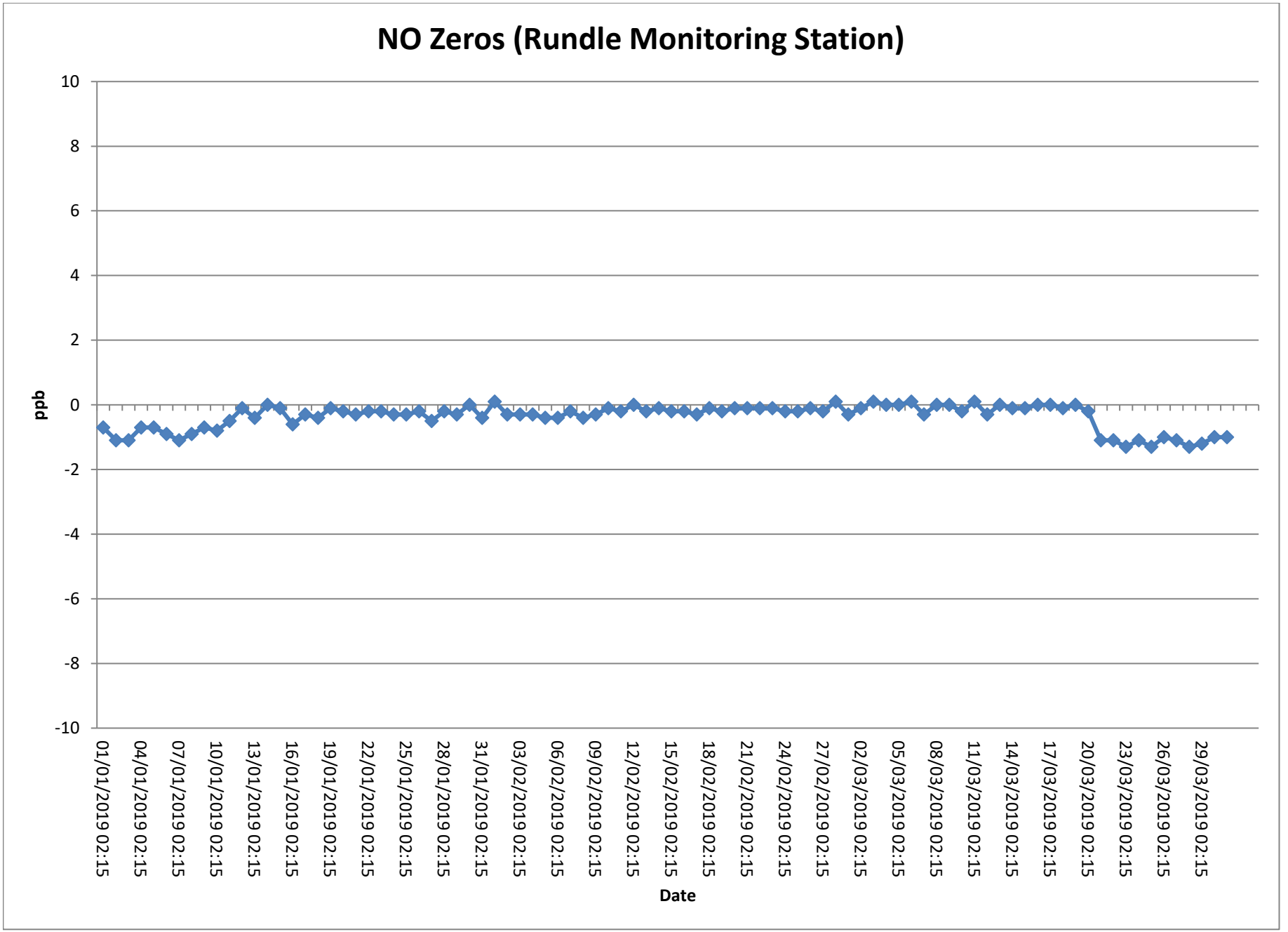
24/02/2019 02:15
26/02/2019 02:15
28/02/2019 02:15
02/03/2019 02:15
Date


NO Zeros (Rundle Monitoring Station)
ppb
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8
6
4
2
0
-2
-4
-6
-8
-10
01/01/2019 02:15
04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
16/01/2019 02:15
19/01/2019 02:15
22/01/2019 02:15
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14/03/2019 02:15
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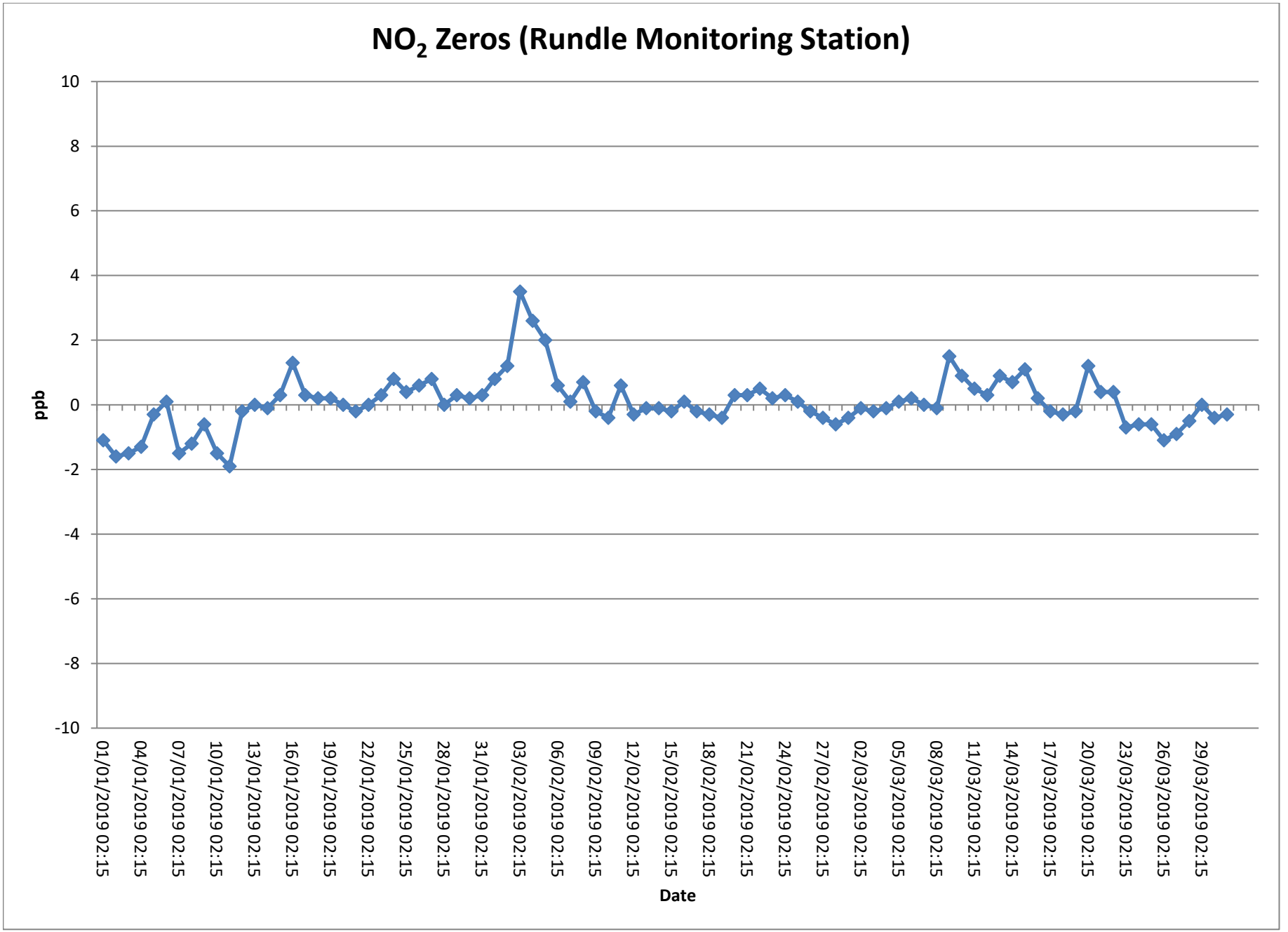
20/03/2019 02:15
23/03/2019 02:15
26/03/2019 02:15
29/03/2019 02:15
Date


NO_2 Zeros (Rundle Monitoring Station)
ppb
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8
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4
2
0
-2
-4
-6
-8
-10
01/01/2019 02:15
04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
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19/01/2019 02:15
22/01/2019 02:15
25/01/2019 02:15
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24/02/2019 02:15
27/02/2019 02:15
02/03/2019 02:15
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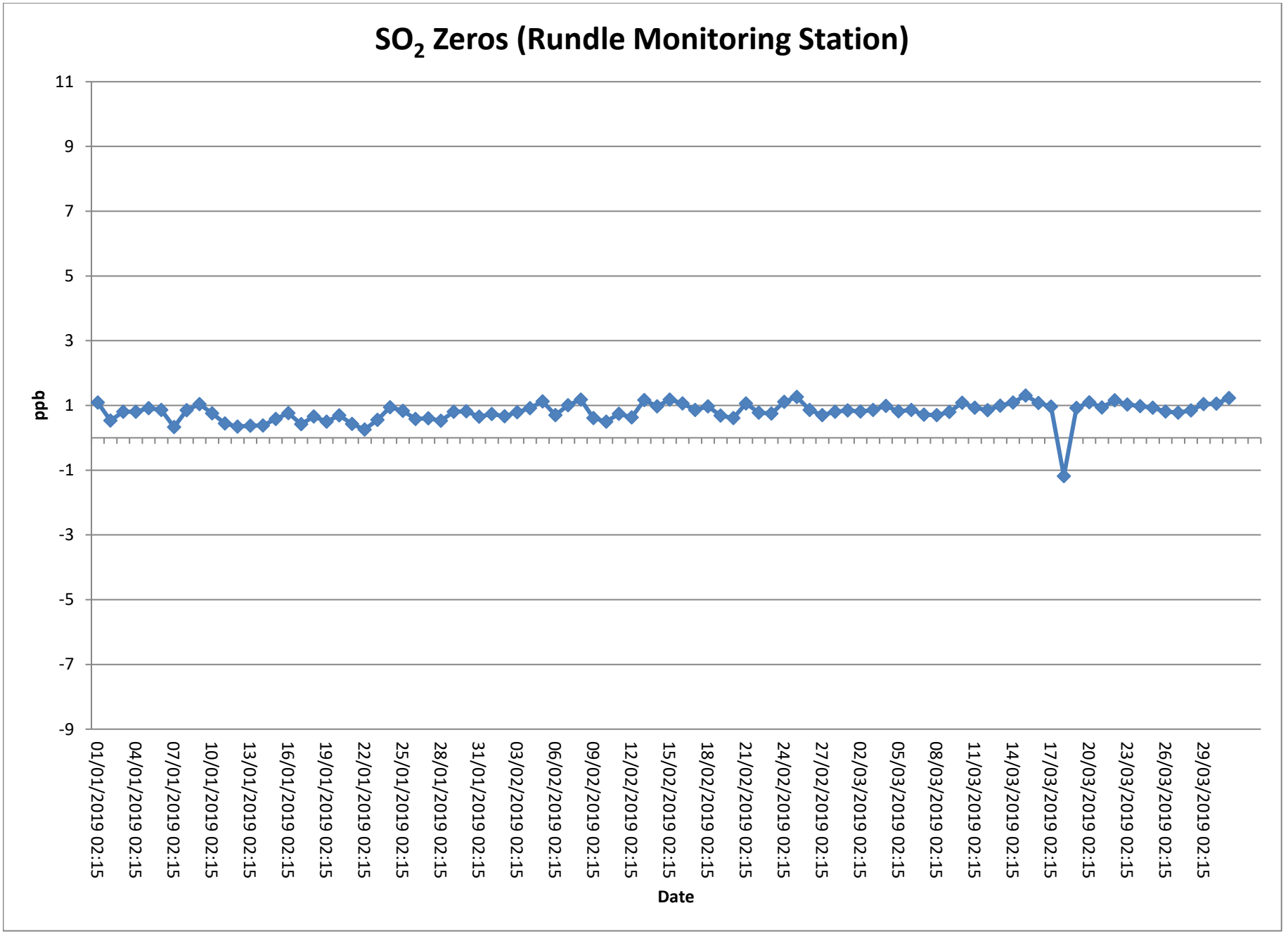
23/03/2019 02:15
26/03/2019 02:15
29/03/2019 02:15
Date


SO_2 Zeros (Rundle Monitoring Station)
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-7
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04/01/2019 02:15
07/01/2019 02:15
10/01/2019 02:15
13/01/2019 02:15
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19/01/2019 02:15
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14/03/2019 02:15
17/03/2019 02:15
20/03/2019 02:15
23/03/2019 02:15
26/03/2019 02:15
29/03/2019 02:15
Date

APPENDIX D

Table D1: 1st Quarter Edit Log for $PM_{2.5}$ at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45201			**Station Name:** Courtice Station					
Station Address: 100 Osbourne Road			**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON					
Pollutants or Parameter: $PM_{2.5}$		**Instrument Make & Model:** Thermo Scientific Model 5030 SHARP Monitor			**s/n:** E-1563			
Data Edit Period	Start Date: January 1, 2019		End Date: March 31, 2019		All testing done in EST			
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	15/02/2019	NJM	Deleted Hours	01/01/2019	00:00	03/01/2019	16:50	PM unit tape break.
2	03/01/2019	SRS	Deleted Hours	03/01/2019	16:50	03/01/2019	18:00	Calibration after tape break.
3	15/02/2019	NJM	Deleted Hours	04/01/2019	12:00	04/01/2019	13:00	Suspected power failure.
4	31/01/2019	SRS	Deleted Hours	31/01/2019	16:00	31/01/2019	19:00	Monthly calibration
5	14/02/2019	SRS	Deleted Hours	14/02/2019	13:00	14/02/2019	16:00	Monthly calibration
6	20/03/2019	NJM	Deleted Hours	15/02/2019	10:00	15/02/2019	12:00	MECP Audit
7	20/03/2019	NJM	Zero Correction	01/02/2019	00:00	28/02/2019	23:00	Correcting values <0 to 0
8	20/03/2019	SRS	Deleted Hours	20/03/2019	14:00	20/03/2019	15:00	Monthly calibration

Table D2: 1st Quarter Edit Log for $PM_{2.5}$ at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45200			**Station Name:** Rundle Road Station					
Station Address: Rundle Road			**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON					
Pollutants or Parameter: $PM_{2.5}$		**Instrument Make & Model:** Thermo Scientific Model 5030 SHARP Monitor			**s/n:** E-1569			
Data Edit Period	Start Date: January 1, 2019		End Date: March 31, 2019		All testing done in EST			
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	15/02/2019	NJM	Deleted Hours	04/01/2019	10:00	04/01/2019	11:00	Suspected power failure at station
2	15/02/2019	NJM	Deleted Hours	07/01/2019	14:00	07/01/2019	15:00	Suspected power failure at station
3	31/01/2019	SRS	Deleted Hours	31/01/2019	15:00	31/01/2019	16:00	Monthly Calibration
4	14/02/2019	SRS	Deleted Hours	14/02/2019	11:00	14/02/2019	12:00	Monthly Calibration
5	21/03/2019	QMI	Deleted Hours	15/02/2019	12:00	15/02/2019	13:00	MECP Audit
6	20/03/2019	SRS	Deleted Hours	20/03/2019	10:00	20/03/2019	11:00	Monthly calibration

Table D3: 1st Quarter Edit Log for NO_X at Courtice Station

Emitter's Name: Durham York Energy Centre			
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107	**Email:** Lyndsay.Waller@Durham.ca
Station Number: 45201		**Station Name:** Courtice Station	
Station Address: 100 Osbourne Road		**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON	
Pollutants or Parameter: NOx	**Instrument Make & Model:** Teledyne Nitrogen Oxide Analyzer Model T200		**s/n:** 675
Data Edit Period	Start Date: January 1, 2019	End Date: March 31, 2019	All testing done in EST

Edit #	Edit date (dd/mm/yyyy)	Editor's Name	Edit Action	Starting		Ending		Reason
				Date (dd/mm/yyyy)	Hour (xx:xx)	Date (dd/mm/yyyy)	Hour (xx:xx)	
1	15/02/2019	NJM	Zero Drift Correction	02/01/2019	02:00	03/01/2019	02:00	Zero Drift Correction
2	15/02/2019	NJM	Deleted Hours	04/01/2019	12:00	04/01/2019	13:00	Suspected power failure.
3	15/02/2019	NJM	Zero Drift Correction	09/01/2019	02:00	10/01/2019	02:00	Zero Drift Correction
4	11/01/2019	SRS	Deleted Hours	11/01/2019	11:00	11/01/2019	15:00	Re-calibration post MECP Audit
5	31/01/2019	SRS	Deleted Hours	31/01/2019	18:00	31/01/2019	22:00	Monthly Calibration
6	15/02/2019	NJM	Zero Correction	01/01/2019	0:00	01/31/2019	23:00	Correcting values <0 to 0
7	07/02/2019	SRS	Deleted Hours	07/02/2019	12:00	07/02/2019	16:00	GPT Check and Calibration
8	14/02/2019	SRS	Deleted Hours	14/02/2019	13:00	14/02/2019	17:00	Monthly Calibration
9	20/03/2019	NJM	Zero Correction	01/02/2019	00:00	28/02/2019	23:00	Correcting values <0 to 0
10	20/03/2019	NJM	Deleted Hours	15/02/2019	10:00	15/02/2019	12:00	MECP Audit
11	20/03/2019	SRS	Deleted Hours	20/03/2019	13:00	20/03/2019	15:00	Monthly Calibration
12	05/04/2019	QMI	Zero Drift Correction	22/03/2019	02:00	30/03/2019	02:00	Zero Drift Correction
13	05/04/2019	QMI	Zero Correction	01/03/2019	00:00	31/03/2019	23:00	Correcting values <0 to 0

Table D4: 1st Quarter Edit Log for NO_X at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Road Station				
Station Address: Rundle Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: NOx			**Instrument Make & Model:** Teledyne Nitrogen Oxide Analyzer Model T200			**s/n:** 676		
Data Edit Period		Start Date: January 1, 2019		End Date: March 31, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	15/02/2019	NJM	Zero Drift Correction	01/01/2019	02:00	02/03/2019	02:00	Zero Drift Correction
2	15/02/2019	NJM	Deleted Hours	04/01/2019	10:00	04/01/2019	11:00	Suspected power failure at station
3	15/02/2019	NJM	Zero Drift Correction	06/01/2019	02:00	08/01/2019	02:00	Zero Drift Correction
4	15/02/2019	NJM	Deleted Hours	07/01/2019	14:00	07/01/2019	15:00	Suspected power failure at station
5	15/02/2019	NJM	Zero Drift Correction	09/01/2019	02:00	11/01/2019	02:00	Zero Drift Correction
6	11/01/2019	SRS	Deleted Hours	11/01/2019	16:00	11/01/2019	17:00	Re-calibration post MECP Audit
7	31/01/2019	SRS	Deleted Hours	31/01/2019	12:00	31/01/2019	15:00	Monthly Calibration
8	15/02/2019	NJM	Zero Correction	01/01/2019	00:00	31/01/2019	23:00	Correcting values <0 to 0
9	21/03/2019	QMI	Zero Drift Correction	03/02/2019	02:00	04/02/2019	02:00	Zero Drift Correction
10	06/02/2019	SRS	Deleted Hours	06/02/2019	14:00	06/02/2019	20:00	GPT Check and Calibration
11	13/02/2019	SRS	Deleted Hours	13/02/2019	16:00	13/02/2019	17:00	Monthly Calibration
12	21/03/2019	QMI	Deleted Hours	15/02/2019	12:00	15/02/2019	13:00	MECP Audit
13	21/03/2019	QMI	Zero Correction	01/02/2019	00:00	28/02/2019	23:00	Correcting values <0 to 0
14	20/03/2019	SRS	Deleted Hours	20/03/2019	10:00	20/03/2019	13:00	Monthly Calibration
15	08/04/2019	QMI	Zero Drift Correction	25/03/2019	02:00	26/03/2019	02:00	Zero Drift Correction
16	08/04/2019	QMI	Zero Correction	01/03/2019	00:00	31/03/2019	23:00	Correcting values <0 to 0

Table D5: 1st Quarter Edit Log for SO_2 at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45201			**Station Name:** Courtice Station					
Station Address: 100 Osbourne Road			**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON					
Pollutants or Parameter: SO_2		**Instrument Make & Model:** Teledyne Sulfur Dioxide Analyzer Model T100				**s/n:** 565		
Data Edit Period	Start Date: January 1, 2019		End Date: March 31, 2019		All testing done in EST			

Edit #	Edit Date (dd/mm/yyyy)	Editor's Name	Edit Action	Starting		Ending		Reason
				Date (dd/mm/yyyy)	Hour (xx:xx)	Date (dd/mm/yyyy)	Hour (xx:xx)	
1	15/02/2019	NJM	Zero Correction	01/01/2019	0:00	31/01/2019	23:00	Correcting values <0 to 0
2	15/02/2019	NJM	Deleted Hours	04/01/2019	12:00	04/01/2019	13:00	Suspected power failure
3	31/01/2019	SRS	Deleted Hours	31/01/2019	17:00	31/01/2019	19:00	Permeation tube replaced and monthly calibration conducted
4	20/03/2019	NJM	Zero Correction	01/02/2019	00:00	28/02/2019	23:00	Correcting values <0 to 0
5	28/02/2019	SRS	Deleted Hours	06/02/2019	10:00	06/02/2019	20:00	Unit malfunction
6	07/02/2019	SRS	Deleted Hours	07/02/2019	15:00	07/02/2019	16:00	Analyzer check
7	14/02/2019	SRS	Deleted Hours	14/02/2019	16:00	14/02/2019	18:00	Monthly Calibration
8	20/03/2019	NJM	Deleted Hours	15/02/2019	10:00	15/02/2019	12:00	MECP Audit
9	20/03/2019	SRS	Deleted Hours	20/03/2019	14:00	20/03/2019	16:00	Monthly Calibration
10	05/04/2019	QMI	Zero Correction	01/03/2019	00:00	31/03/2019	23:00	Correcting values <0 to 0

Table D6: 1st Quarter Edit Log for SO_2 at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Road Station				
Station Address: Rundle Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: SO_2			**Instrument Make & Model:** Teledyne Sulfur Dioxide Analyzer Model T100				**s/n:** 566	
Data Edit Period		Start Date: January 1, 2019		End Date: March 31, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	15/02/2019	NJM	Zero Correction	01/01/2019	0:00	31/01/2019	23:00	Correcting values <0 to 0
2	15/02/2019	NJM	Deleted Hours	04/01/2019	10:00	04/01/2019	11:00	Suspected power failure at station
3	15/02/2019	NJM	Deleted Hours	07/01/2019	14:00	07/01/2019	15:00	Suspected power failure at station
4	31/01/2019	SRS	Deleted Hours	31/01/2019	15:00	31/01/2019	16:00	Monthly Calibration
5	14/02/2019	SRS	Deleted Hours	14/02/2019	11:00	14/02/2019	12:00	Monthly Calibration
6	21/03/2019	QMI	Deleted Hours	15/02/2019	12:00	15/02/2019	13:00	MECP Audit
7	08/04/2019	QMI	Zero Correction	01/02/2019	00:00	28/02/2019	23:00	Correcting values <0 to 0
8	08/04/2019	QMI	Added Hours	18/03/2019	19:00	19/03/2019	01:40	Flag was not deactivated after Calib therefore hours were added back into dataset
9	18/03/2019	SRS	Deleted Hours	18/03/2019	17:00	18/03/2019	19:00	Analyzer maintenance
10	20/03/2019	SRS	Deleted Hours	20/03/2019	09:00	20/03/2019	10:00	Monthly Calibration
11	08/04/2019	QMI	Zero Correction	01/03/2019	00:00	31/03/2019	23:00	Correcting values <0 to 0

Table D7: 1st Quarter Edit Log for Meteorological Parameters at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: Ambient T, P, RH and Rain			**Instrument Make & Model:** Miscellaneous Meterological Instrumentation				**s/n:** N/A	
Data Edit Period		Start Date: January 1, 2019		End Date: March 31, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	15/02/2019	NJM	Deleted Hours	04/01/2019	12:00	04/01/2019	13:00	Deleted hours due to suspected power failure.

Table D8: 1st Quarter Edit Log for Meteorological Parameters at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: WS, WD, Ambient T, P, RH and Rain			**Instrument Make & Model:** Miscellaneous Meterological Instrumentation			**s/n:** N/A		
Data Edit Period		Start Date: January 1, 2019		End Date: March 31, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	15/02/2019	NJM	Deleted Hours	04/01/2019	10:00	04/01/2019	11:00	Suspected power failure therefore hours deleted
2	15/02/2019	NJM	Deleted Hours	07/01/2019	14:00	07/01/2019	15:00	Suspected power failure therefore hours deleted

Table D9: 1st Quarter Edit Log for Non-Continuous at Courtice Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** 2391 Lakeshore Road West, Mississauga, ON L5J 1K1				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period		Start Date: January 1, 2019		End Date: March 31, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	03/01/2019	SRS	Maintenance and Repair	30/12/2018	13:20	03/01/2019	16:53	Tape re-spooled
2	08/01/2019	MT	Changeover	08/01/2019	13:00	08/01/2019	13:00	TSP/PAH Changeover
3	10/01/2019	MT	Changeover	10/01/2019	14:45	10/01/2019	14:45	TSP/PAH Changeover
4	20/01/2019	MT	Changeover	20/01/2019	12:45	22/01/2019	12:45	TSP/PAH Changeover
5	22/01/2019	MT	Changeover	22/01/2019	12:50	22/01/2019	12:50	TSP/PAH Changeover
7	01/02/2019	MT	Changeover	01/02/2019	13:45	01/02/2019	13:45	TSP/PAH Changeover
8	04/02/2019	MT	Changeover	04/02/2019	13:40	04/02/2019	13:40	TSP/PAH Changeover
9	12/02/2019	SRS	Maintenance and Repair	12/02/2019	12:00	12/02/2019	12:00	Lamp Inspection
10	13/02/2019	MT	Changeover	13/02/2019	12:40	13/02/2019	12:40	TSP/PAH Changeover
12	15/02/2019	SRS	Audit	15/02/2019	10:00	15/02/2019	10:00	Audit with Colman Wang
13	15/02/2019	MT	Changeover	15/02/2019	12:00	15/02/2019	12:00	TSP/PAH Changeover

Table D9: 1st Quarter Edit Log for Non-Continuous at Courtice Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** 2391 Lakeshore Road West, Mississauga, ON L5J 1K1				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period	Start Date: January 1, 2019			End Date: March 31, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
14	19/02/2019	SRS	Maintenance and Repair	19/02/2019	15:00	19/02/2019	15:00	Hi-Vol Motor Installation and Calibration
15	25/02/2019	MT	Changeover	25/02/2019	12:00	25/02/2019	12:00	TSP/PAH Changeover
16	28/02/2019	SRS	Audit	28/02/2019	10:00	28/02/2019	10:00	MECP Audit (Passed)
17	28/02/2019	MT	Changeover	28/02/2019	11:30	28/02/2019	11:30	TSP/PAH Changeover
18	09/03/2019	MT	Changeover	28/02/2019	11:30	28/02/2019	11:30	TSP/PAH Changeover
19	12/03/2019	MT	Changeover	12/03/2019	11:05	12/03/2019	11:05	TSP/PAH Changeover
20	21/03/2019	MT	Changeover	21/03/2019	12:35	21/03/2019	12:35	TSP/PAH Changeover
21	23/03/2019	MT	Changeover	23/03/2019	11:00	23/03/2019	11:00	TSP/PAH Changeover
22	26/03/2019	MT	Changeover	26/03/2019	13:40	26/03/2019	13:40	TSP/PAH Changeover

Table D10: 1st Quarter Edit Log for Non-Continuous at Rundle Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Station				
Station Address: 100 Osbourne Road				**Emitter Address:** 2391 Lakeshore Road West, Mississauga, ON L5J 1K1				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period	Start Date: January 1, 2019			End Date: March 31, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	04/01/2019	SRS	Maintenance and Repair	04/01/2019	10:30	04/01/2019	11:30	Re-establish communication betw CR1000 and Envidas
2	08/01/2019	MT	Changeover	08/01/2019	12:00	08/01/2019	12:00	TSP/PAH Changeover (SO2 and NOx System Reset)
3	10/01/2019	MT	Changeover	10/01/2019	13:50	10/01/2019	13:50	TSP/PAH Changeover
4	20/01/2019	MT	Changeover	20/01/2019	11:45	20/01/2019	11:45	TSP/PAH Changeover
5	22/01/2019	MT	Changeover	22/01/2019	11:40	22/01/2019	11:40	TSP/PAH Changeover
7	01/02/2019	MT	Changeover	01/02/2019	13:00	01/02/2019	13:00	TSP/PAH Changeover
8	04/02/2019	MT	Changeover	04/02/2019	13:00	04/02/2019	13:00	TSP/PAH Changeover (SO2 and NOx System Reset)
9	06/02/2019	MT	Calibration	06/02/2019	14:00	06/02/2019	14:00	Calibrated NOx
10	13/02/2019	MT	Changeover	13/02/2019	11:30	13/02/2019	11:30	TSP/PAH Changeover
13	15/02/2019	MT	Changeover	15/02/2019	10:15	15/02/2019	10:15	TSP/PAH Changeover
14	15/02/2019	SRS	Audit	15/02/2019	12:00	15/02/2019	12:00	Audit with Colman Wang

Table D10: 1st Quarter Edit Log for Non-Continuous at Rundle Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Station				
Station Address: 100 Osbourne Road				**Emitter Address:** 2391 Lakeshore Road West, Mississauga, ON L5J 1K1				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period	Start Date: January 1, 2019			End Date: March 31, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
15	19/02/2019	SRS	Maintenance and Repair	19/02/2019	15:00	19/02/2019	15:00	Rebrush and Calibrated Hi-Vol and Chart Recorder
16	25/02/209	MT	Changeover	25/02/209	11:30	25/02/209	11:30	TSP/PAH Changeover (SO2 and NOx System Reset)
17	28/02/2019	MT	Changeover	28/02/2019	10:40	28/02/2019	10:40	TSP/PAH Changeover
18	09/03/2019	MT	Changeover	09/03/2019	09:40	09/03/2019	09:40	TSP/PAH Changeover
19	12/03/2019	MT	Changeover	12/03/2019	10:20	12/03/2019	10:20	TSP/PAH Changeover
20	18/03/2019	SRS	Maintenance and Repair	18/03/2019	16:30	18/03/2019	16:30	SO2 Low Overnight (span and lamp output), Hardware cal.
22	21/03/2019	MT	Changeover	21/03/2019	13:30	21/03/2019	13:30	TSP/PAH Changeover
23	23/03/2019	MT	Maintenance and Repair	23/03/2019	10:15	23/03/2019	10:15	TSP/PAH Pickup
24	26/03/2019	MT	Maintenance and Repair	26/03/2019	14:10	26/03/2019	14:10	TSP Setup, NOx and SO2 System Reset